An Assessment of the Implementation of Green Public Procurement in the City of Johannesburg Metropolitan Municipality

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DECLARATION

I declare that this research report is my own work. It is submitted in the University of Johannesburg for the degree of Master of Technology in Operations Management in 2019. It has not been submitted before for any other degree in any University.

(Signature of candidate)

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To Musolwa my beautiful wife and my wonderful children (Dakalo, Thanyani and Mukona), I say thank you for always believing in Daddy, you guys are my anchor (Big up to Teamwork).

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Glory be to God the Lord almighty

ABSTRACT

Green Public Procurement (GPP) is emerging as one of the mitigation plans against climate change globally. It is already a proven concept in countries such as Austria, Denmark, Finland, Germany, Netherlands, Sweden and UK. South Africa is trailing in the implementation of GPP especially in local government. This study was undertaken to assess the implementation of GPP in the CoJ since it has included a high-level statement with reference to GPP in its supply chain management (SCM) policy despite the fact that it does not have a strategy, framework or guidelines on GPP implementation. The main aim of the research was to establish factors that might be contributing towards the non-implementation of GPP practices in the CoJ municipality and to provide recommendations to the city's council for adoption. To determine factors that might be contributing to non-implementation of GPP, a quantitative research method was utilised to collect data from 100 targeted procurement staff using a survey instrument to assess the knowledge and understanding of GPP.

The study collected data on the following factors: cost of green products, management practices, training and awareness and bid specification. The data collected was analysed using the latest IBM SPSS® software for descriptive and inferential statistics. The results indicated that the cost of green products, management practices together with training and awareness were significant factors for implementation of GPP at 5 percent level of significance. It was observed during the study that most of the employees including senior management were not aware of the concept of GPP and this was delaying the implementation of GPP practices in the CoJ.

KEY WORDS: CoJ, Training and Awareness, Management Practices, Cost of Green Products, Bid Specification, GPP

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LIST OF ABREVIATIONS

CoJ - City of Johannesburg

CoT - City of Tshwane

DEA - Department of Environmental Affairs

DEFRA - The Department for Environment Food and Rural Affairs

ECAP - Energy and Climate Action Plan

EMS - Environmental Management System

EU - European Union

GEGDS - Gauteng Employment Growth and Development Strategy

GDED - Gauteng Department of Economic Development

GMC - Greenest Municipality Competition

GPP - Green Public Purchasing

GSCM - Green Supply Chain Management

ICLEI - International Council for Local Environmental Initiatives

ICT - Information Communication Technology

IISD - International Institute for Sustainable Development

JSE - Johannesburg Stock Exchange

LCC - Life-Cycle Costing

MFMA – Municipal Finance Management Act

NASA - National Aeronautics and Space Administration

NMBM - The Nelson Mandela Bay municipality

NTR - National Treasury Regulations (2005)

PFMA - The Public Finance Management Act (1999)

PPFR - Preferential Purchasing Framework Regulations (2001)

PPPFA - Preferential Purchasing Policy Framework Act (2000)

SALGA - South African Local Government Association

SCM - Supply Chain Management

SMME - Small Micro Medium Enterprises

SDBIP - Service Delivery Business Implementation Plan

WWF - World Wide Fund for Nature

1. INTRODUCTION

1.1 Introduction

The CoJ municipality is categorised as a level (A) municipality in South Africa as characterised by the Municipal Structures Act, No. 117 of 1998. The CoJ is one the first cities in Africa to join the International Council for Local Environmental Initiatives (ICLEI) network and it has actively partaken and led a range of initiatives, both locally within its municipality and regionally as part of the Pan-African ICLEI African association of Local Governments for Sustainability (ICLEI, 2017). In 2014, the CoJ participated in the global One Planet City Challenge (OPCC) as a clear indication that the CoJ is consciously taking steps towards a more sustainable future for the wellbeing and prosperity of its citizens (WWF, 2014).

The CoJ spends an average of 75 percent of its budget allocation on purchasing of goods and services from local suppliers according to the Service Delivery Business Implementation Plan (SDBIP, 2016). In view of this considerable purchasing power, the CoJ has massive power to motivate and drive markets for sustainable consumption and production if they can make a resolute endeavour to procure environmentally friendly products and services.

On 29 August 2017, the CoJ reclaimed its status as South Africa's greenest municipality when it was announced as the overall winner of the metropolitan category of the 2017 edition of the annual Greenest Municipality Competition (GMC) Awards. The GMC is awarded in recognition of its job creation projects around issues such as waste management, climate change and the green economy (City of Johannesburg, 2017). To better coordinate programme implementation and manage interdependencies, the CoJ implements a cluster system with four clusters indicated in Figure 1.1.

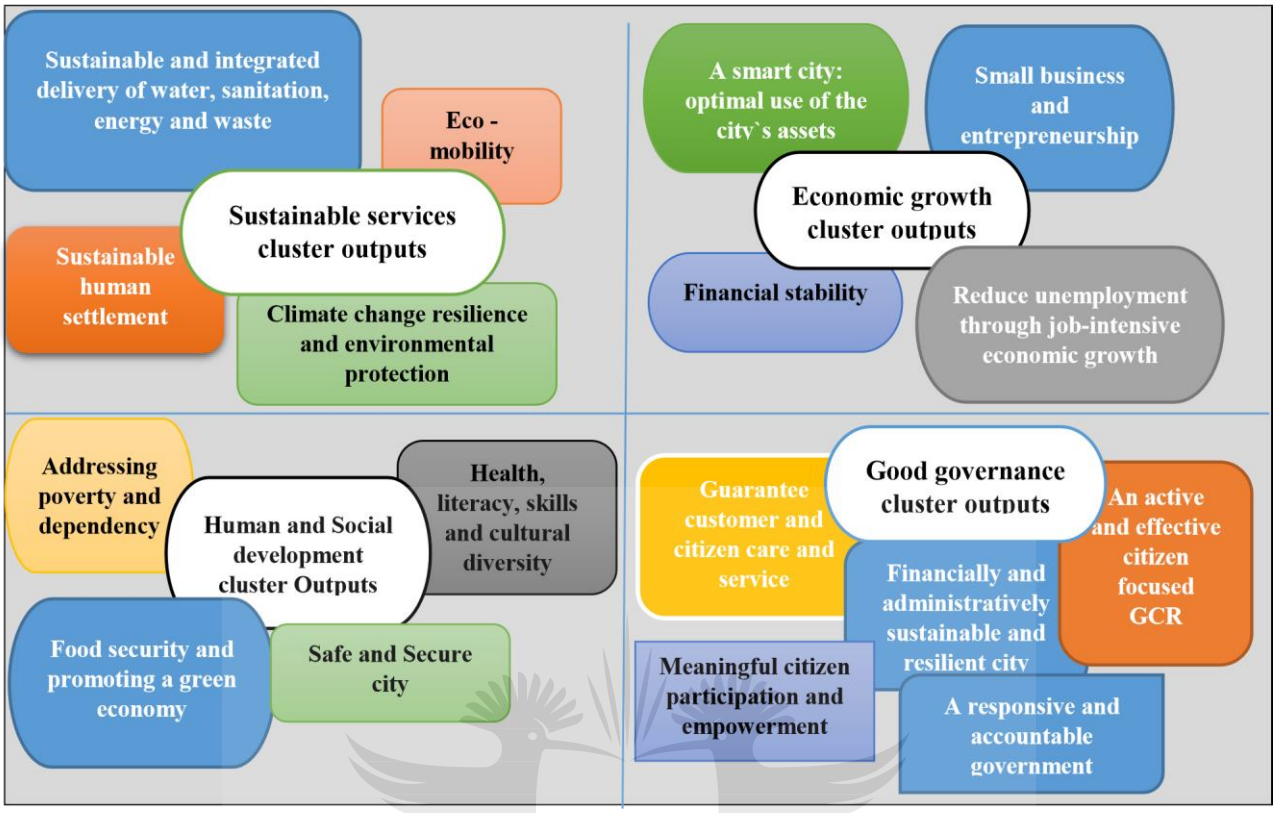


Figure 1.1: City of Johannesburg cluster system (Source: City of Johannesburg, 2015a)

GPP management is amongst the new plans that are being adopted globally to assist local governments in providing solutions for sustainable development and to embrace the green economy through the implementation of long-term sustainable policies and strategies. The incorporation of GPP features into existing purchasing policies of municipalities can be the initial and most economical step in accomplishing a GPP programme. The European Commission`s communication describes GPP as "a process whereby public authorities seek to procure goods, services and works with a reduced environmental impact throughout their life-cycle when compared to goods, services and works with the same primary function that would otherwise be procured" (European Commission, 2009).

The European Commission (2014) defines GPP as a practice whereby purchasers of goods and services take into consideration environmental impact as well as social and economic implications. The researcher conducted preliminary interviews with the Director and Assistant Directors of SCM to ascertain the status of GPP in the CoJ and the responses showed that the CoJ was still grappling with the implementation of GPP. This study seeks to assess these challenges and to propose

solutions. Deif (2011) explained that GPP practices lead to an advanced environmental performance.

1.2 Background of Study

South Africa is among the worldwide pioneers with regards to "green approach". The government of South Africa partnered with the Department of Environmental Affairs and Tourism and introduced a Green Fund policy to support initiatives that would reduce carbon outputs (Department of Environmental Affairs and Tourism, 2005). The Green Fund aims to support green enterprises in the South African community that will back up poverty reduction and job creation for example renewable electricity, waste management, water saving, solar water heater systems, landfill gas, transportation and many more. As a developing country, South Africa faces massive challenges in its sustainable supply management practices, legislations and policies as well as bid indiscretions (Smart Purchasing, 2011). This can for the most part be ascribed to insufficient ability to push the work and the inadequate roll-out of the sustainable purchasing process.

The Swedish city, Goteborg partnered with Nelson Mandela Bay Metro in an attempt to overcome resource challenges by providing real on-the-ground advice and support on GPP. In most instances, implementation fails because there is no commitment from staff (departmental champions) and politicians and there is no training and understanding of efficient purchasing principles. Pricing of green products is also believed to be high and that there is limited availability of green products locally. According to Mohninger (1999), the reasons for the lack of implementation may include tremendous national environmental issues to be addressed and underdeveloped markets for green product.

Shaftel (2019) explains that global warming is the change in the overall temperature drift across the entire globe since the early 20th century due to the increase in gaseous emissions since industrialisation. The burning of fossil fuels contribute towards the formation of environmental change which escalates heat catching gases to the earth's climate. Events such as this cause changes such as mountain glaciers and life-threatening weather events.

Confirmation of fast natural change incorporates rise in sea level and overall temperature, warming oceans, contracting ice sheets, decline in cool sea ice, unprecedented events, ocean maturation and reduced snow spread as shown in Figure 1.2. Nature issues ought to wind up a critical segment of

administration assignments given the expanding consciousness of environmental change and an Earth-wide temperature boost.

Figure 1.*2: How climate is changing (Source: NASA, 2011)*

Global science on climate change has shown that global warming is definite and that impacts such as ocean acidification are already quantifiable. The results of global climate change are amongst others famine, tidal waves, hurricanes, tornados and heat waves. These dangerously influence people's prosperity, households, sustenance security, regular assets and support networks. As a result these occurrences lead to income loss and dislodgement. It is mostly poor people who suffer from these consequences because they are exposed to areas that are at risk. According to the City of Cape Town (2012), Cape Town metropolitan municipality has already begun experiencing severe weather disasters that can be associated with climate change. These events include:

- Increased and rapidly spreading fires affecting lives, agribusiness and biodiversity.
- Lourensford fires in 2013
- Severe droughts in 2002-2005.
- Floods in Lourens 2013
- Windstorms in Manenberg in 1999 and 2002

1.3 Problem Statement

The implementation of GPP in South African local government is still a challenge and the CoJ is one of the municipalities that are lagging behind with the implementation although they have included it in their Supply Chain Management (SCM) policy under Section 24 which states that: "All procurement requirements are to be undertaken in line with the principles of green procurement in order to conserve the environment". The SCM policy is not clear on how the principles of GPP can be incorporated in the procurement processes. As a result, procurement personnel are not purchasing goods and services with a reduced environmental impact throughout their life-cycle, for example, the CoJ is still procuring incandescent lights for its head office building in Braamfontein (Metro Centre). The procurement of Light Emitting Diodes (LED) which are environmentally friendly can go a long way in reducing carbon footprint and contribute to the reduction of greenhouse gas emissions.

According to the City of Johannesburg (2009), projections of the climate model for the CoJ suggest that the local weather is prone to become notably warmer and more humid in future. The models indicate that temperatures for the CoJ may rise by around 2.3 ℃ by the near future (2056 - 2065) and by around 4.4 ℃ by the far future (2081 - 2100). Furthermore, there is a considerable risk that the CoJ will encounter an increase in annual precipitation characterised by a higher frequency of storm events and a longer season of rain (finishing later in the autumn and potentially starting earlier in the spring).

The CoJ is faced with significant developmental challenges regarding improving inequality and poverty, social exclusion, climate change mitigation, rapid population growth, resource constraints and escalating prices without necessarily increasing resource consumption. Unemployment in the city still lies around 31 percent while youth unemployment is close to 40 percent (Mushayanyama, 2016). This means that the city has a mandate to ensure that the private sector, government and communities contribute towards achieving a safe and sustainable environment. Global warming is a threat to environmental sustainability since it brings about major changes in the ecosystem, alters the quality and quantity of existing natural resources and lowers environment efficiency (Mushayanyama, 2016).

The other biggest environmental challenge that the CoJ is facing is dealing with waste generation and waste management caused by fast growth in population which leads to an intensified demand

for water, energy and ecological materials that generate solid, gaseous and liquid waste also known as pollution. Although there has been a great improvement in green initiatives, there is a lot of proof that shows that the implementation of GPP is still lacking. This research seeks to assess the shortcomings on the implementation of GPP practices in the CoJ. Agyepong and Nhamo (2014) concluded that metropolitan municipalities were still struggling to include GPP in their SCM policies with the exception of City of Cape Town and eThekwini Metropolitan who have included GPP strategies into their SCM policies. This research will conduct a survey to establish the challenges leading to non-implementation of GPP.

1.4 Purpose and Objectives of the Study

1.4.1 Purpose of the study

The purpose of the research was to determine the factors that are leading to non-implementation of GPP practices in the CoJ municipality. In other words, the purpose is to ascertain the challenges of implementing GPP. GPP enables specialists to accomplish environmental targets and address environmental problems such as air and water pollution (by using chemicals cautiously and reducing the use of substances that are hazardous to the environment). GPP also promotes sustainable agriculture by promoting the purchasing of organically produced food.

1.4.2 Objectives of the study

The main objective of the study is to determine the factors that affect implementation of GPP practices in the CoJ municipality. The specific objectives of the research are the following:

i To measure if management practices determine the extent to which the CoJ municipality practices sustainable purchasing.

ii To assess how the cost of green products and services determines the implementation of GPP practices by the CoJ municipality.

iii To evaluate if training and awareness determines the extent to which the CoJ municipality practices sustainable purchasing.

iv To assess how bid specification determine the effective implementation of GPP by the CoJ municipality.

1.5 Research Hypotheses

The research hypotheses based on each research objective are:

H1: Management practices positively influence the implementation of GPP in the CoJ municipality.

H2: The cost of green products positively influences the implementation of GPP and practices in the CoJ municipality.

H3: Training and awareness positively influence the implementation and practice of sustainable purchasing in the CoJ municipality.

H4: Bid specification positively influences the implementation and practice of sustainable purchasing in the CoJ municipality.

Ageyepo and Nhamo (2014) made the following interesting findings in their research:

i. South Africa's metropolitan personnel have a decent comprehension of sustainable advancement; and
ii. Newer metropolitan municipalities such as Mangaung and Buffalo City have not made any clear progress in making specific references to GPP in different policies as equated to old Metropolitan municipalities such as NMBM, CoJ, eThekwini, CoT and Ekurhuleni. However, there is a lack of broad enactment of sustainable SCM across all metropolitan municipalities.

1.6 Research Questions

The primary research questions are:

i. To what degree do CoJ management practices decide how GPP policies are implemented?
ii. To what extent does the cost of green products affect the CoJ's adoption of GPP practices?
iii. To what degree do bid specifications influence the implementation of green products in the CoJ?
iv. What is the level of awareness and training on sustainable purchasing policies and procedures in the CoJ?

1.7 Significance of the Study

The research will contribute to the current work on sustainable purchasing adoption and will play a major role in understanding GPP practices in the CoJ and in South African local government. The CoJ with an area of 1,645 km^2 is one of the largest urban communities in South Africa and is home to both the well off and poor people, residents and displaced people, multinational corporations and rising ventures. It comprises of seven regions (Mushayanyama, 2016). The research will help to understand the green initiatives, plans, actions around the globe and areas where improvement is needed in terms of sustainable purchasing. The current research demonstrates that South African metropolitan municipalities, particularly the CoJ, are substantial consumers of resources and heavy producers of contaminations to the environment (Mkhize, 2004).

GPP is implemented in private and public organisations across developed and developing countries, recognising that there are financial and other gains to be made through more strategic purchasing. With government purchasing accounting for approximately 29 percent of South Africa's GDP, there is a significant opportunity to use this buying power to strengthen resource efficiency, support local industries and the production of green goods (Turley and Perera, 2014).

1.8 Conclusion

This chapter presented the background of GPP in the CoJ and it covered the problem statement, purpose and objectives of the study, research hypothesis, research questions and the significance of the study.

1.9 Dissertation Outline

The chapters in this study will be outlined as follows:

Chapter one: Introduction

This chapter presents the reader with the background to the study, the significance of the study, research questions, hypothesis and the purpose and objectives of the study.

Chapter two: Literature review

This chapter reviews a theoretical and empirical literature on GPP practices. A thorough trend of sustainable purchasing implementation is reviewed flowing from global, national and local

government spheres. Case studies on GPP are evidenced in this chapter which lays a solid foundation to analyse the findings and discussions in Chapter four.

Chapter three: Research Methodology

This chapter presents research design and methodology used in this study. The research techniques and methods used to collect and analyse the data are also deliberated.

Chapter four: Research Analysis

This chapter elaborates on descriptive statistics, the analysis of the participants' responses in relation to the existing research in sustainable purchasing as reviewed in chapter two. Tables and graphs are used to reflect the findings of the data analysis.

Chapter five: Discussion and Recommendations

This chapter presents research findings and results. In addition, recommendations for future research are drawn from the results and conclusions.

2. LITERATURE REVIEW

2.1 Introduction

This section commences by reflecting on regulatory framework for purchasing in South African local government and discusses the norm model theory and theory of diffusion of innovation, the importance of implementing GPP, factors related to implementation of GPP and the international context and leading international initiatives, plans, projects and activities that have been undertaken by different government authorities in an endeavor to implement GPP. The South African context as well as leading initiatives, activities, plans and projects are discussed thereafter.

The chapter also reviews the theoretical and empirical framework relevant to the research study. Green public purchasing is quickly growing and increased attention in the role of governments globally is intensifying. Emphasis is also given to the techniques and methods used to establish the variables that affect the implementation of GPP.

2.2 The Regulatory Framework for Purchasing in the Public Sector

As part of crafting sustainable purchasing policies, municipalities must safeguard that these policies (Urban Seed Update, 2012):

- are lined up with their current SCM administrative structures;
- avoid struggle between the Preferential Purchasing legislation and environmental standards or criteria in the approach;
- include sustainable purchasing in all aspects of the SCM cycle; and
- categorise sustainable purchasing inside the current structures set out by the administrative structure.

The following Regulations and Acts establish a regulatory framework for SCM:

1. The Public Finance Management (Act no 1 of 1999) (PFMA) – RSA (1999)
2. Municipal Finance Management (Act no 56 of 2003) (MFMA) – RSA (2003)
3. Preferential Procurement Policy Framework (Act no 5 of 2000) (PPPFA) – RSA (2000)
4. Preferential Procurement Framework Regulations (2001) (PPFR)
5. National Treasury Regulations (2005) (NTR)

Fundamentally, the MFMA requires every municipality in South Africa to implement its very own SCM policy. Section 112 (i) of the act requires that purchasing systems ought to be impartial, fair, transparent, competitive and cost effective.

Section 112 (ii) dictates that SCM policy must conduct bid assessments based on the best value for money. A research undertaken by the IISD revealed that the legislative and regulatory environment of South Africa supports sustainable supply chain (Turley and Perera, 2014). The broad policy environment in South Africa promotes resource efficiency and the Green Economy and GPP aligns to the NDP, NGP and the IPAP all of which prioritise both localisation of industrialisation and resource efficiency (Turley and Perera, 2014).

2.3 Norm Model Theory

Hyden (2002) argues that for GPP to become successful, procurement officials must possess a certain set of values. Those values will serve as motivation towards knowledge of GPP, environmental consideration and the prospects to practice GPP. According to Hyden (2002), for GPP public policies to be transformed into actions, some normative component example knowledge and systemic conditions are critical. This theory creates space for analysis of procurement personnel and analyses how the norms can affect the guidelines and practical implementation of GPP. Hyden's argument is that norms can be studied empirically and would assists us to understand the reason why some pattern of action arises while others do not.

The study of GPP within this theory provides an analysis of how well environmental considerations have been incorporated in the SCM practices. The norm model provides the reasons behind an action. It indicates one's knowledge and opportunity to act accordingly and can be used as an indicator of the driving force towards a certain pattern of action and practices (Hyden, 2002). This theory is relevant to the study as it reflects on the knowledge gaps and the perception of the procurement officers in the implementation of GPP.

2.4 Theory of Diffusion of Innovation

Rogers (1995) explains that the theory of diffusion of innovation was derived in communication to explain how an idea or concept gains momentum and diffuses through a population or a social system. The ultimate results of diffusion is that people, as part of a social system adopt a new idea or behavior such that they begin to do things differently from their traditional routine (for example,

perform a new behavior). The critical aspect in the adoption of the new behavior is that the person must perceive it as innovation. That is what makes diffusion possible. Sarkis (2011) suggest that diffusion of innovation may offer an appropriate theoretical basis for additional GPP research.

2.5 Importance of Implementing GPP

Implementation of GPP practices has been identified by Govindan, Kaliyan, Kannan and Haq (2014) as one of the modern strategies in business that can facilitate the growth of small micro medium enterprises (SMME) to be successful in their operations. According to Deif (2011), implementing GPP helps companies become more aware of their obligation to safeguard the environment. This opinion is backed by Flammer (2013), who concluded that GPP is a dual approach which is not only aiming to protect the environment, but to also meet socio-economic problems. Green procurement has become one of the best practices for emerging businesses, perhaps because of their microeconomic and macroeconomic importance (Geng, Mansouri and Aktas, 2017). Green procurement is also seen as critical in tracking and controlling service provider performance targets in meeting an organisation`s expectations and requirements through its ability to deliver products in line with environmental specifications (Eltayeb, Zailani and Ramayah, 2011). Diabat (2011) investigated several drivers that involve the implementation of green supply chains and found that government legislation was the main driver that assist collaboration between product designers and service providers in order to reduce environmental impact. The study found that GPP leads to positive environmental impact without compromising on costs and profitability.

GPP has been identified as one of the alternative ways of reducing carbon footprint in government operations and it also promotes environmental goals by incorporating green aspects in purchasing as part of the government`s responsibility to enhance the quality of life and the environment (OECD, 2012). GPP can assist organisations to increase their productivity, minimise liabilities, and gain competitive advantage. The fact is that implementing GPP is a good way of finding products with a high price-performance ratio and with better use rates (Kalubanga, 2012).

Rao and Holt (2005) piloted the first experiential study to assess the relationship between GPP practices and improved competitiveness and economic performance among a sample of corporations in South East Asia. The research discovered that incorporating GPP into SCM processes lead to an integrated SCM which eventually leads to improved competitiveness and

economic performance. Zhu and Sarkis (2004) studied the link between GPP practices in the manufacturing sector in China and their monetary and green impact. The study discovered that there is a powerful positive link between GPP practices and positive monetary and green performance. The study concluded that there would be important "win-win" opportunities for Chinese manufacturing sector that plans to implement GPP practices.

2.6 Factors Related to Implementation of GPP

2.6.1 Management Practices

Blome, Hollos, and Paulraj (2013) postulate that top management`s support and organisation's market performance equally lead to the implementation of GPP. Björklund (2011) is of the opinion that executive management and politicians are influential in the purchasing of green products and Das and Chowdhury (2012) stated that employees are often reluctant or unable to pursue GPP initiatives when there is no support from the top management and political principals. Management plays a major role in any implementation of a new system or solution in an organisation. Management behavior refers to the working processes and innovations that management apply to advance the efficiency of workflow processes. Management practices relates to sets of common practices used by organisations to attain improved outcomes. Examples are quality management, market orientation and strategic management (Hidson, 2017), which are general bodies of knowledge that merge and document companies' experience and research in the field. Smith (2003) build upon this contingency tactic, stating that the accomplishments of management practices are organisation specific and these are affected by the existing organisational situation.

2.6.2 Cost of Green Goods

There is a greater perception that eco-friendly products costs more than the conventional alternatives simply because these products are not locally available. Arisa and Muturi (2016) found that the cost of green products influences the green implementation. However, Porter and van der Linde (1995) state that good regulations can guide innovation and positive results that can reward for the cost of those regulations. Agyepong and Nhamo (2014) believe that to dismiss the perception that GPP is costly, municipalities should be able to apportion a distinct budget for the implementation of GPP. Municipalities may consider working in partnership with the corporate sector in order to succeed in the implementation of GPP. A study conducted by Gatari and Were

(2014) in the manufacturing sector in Kenya established that cost of green products had a substantial negative effect on implementation of GPP in the manufacturing sector. The major problem was that the industry has been set up to concentrate on purchase price of green products instead of unpacking all the additional costs in relation to maintaining a product or life cycle of a product.

2.6.3 Training and Awareness

According to Gustovo (2014), it is the responsibility of an organisation to disseminate GPP information within its structures. Making information and awareness available to employees is important to ensure all those within an organisation comprehend what they need to do, why should they do it, how should they do it and where they can access training and supervision. Van Niekerk and von Solms (2004) argue that awareness initiatives while essential are not enough to achieve the anticipated outcomes.

2.6.4 Bid Specification

According to Smart Purchasing (2011), "the Bid Specification Committee (BSC) is responsible for compiling and drafting of bid specifications for the procurement of goods and services by the municipality and its entities". The BSC must comprise of one or more officials of the municipality or entity and "preferably" the manager who is responsible for the services that are involved. Smart Purchasing (2011) states that when advertising for new tenders, it is critical to include the green specification requirement to attract the suitable suppliers with green products and services. Without appropriate suppliers an organisation cannot actively choose to procure green options. Brammer and Walker (2011) stated that the key setback in the adoption of GPP is the complexity in engaging service providers. Lysons and Farrington (2012) indicated that some of the GPP initiatives were hampered by the reluctance of suppliers to cooperate with institutions and some of the reasons may be over sensitive company information and scarcity of resources. According to Cooper, Frank and Kemp (2000), one study revealed that procurement personnel are not skilled on how to incorporate environmental issues in procurement processes. This statement concurs with Maignan, Hillebrand and McAlister (2002) who asserted that many procurement managers do not possess the skills to concretely and systematically include green elements into buying decisions.

2.7 International Context

Kipkorir and Wanyoike (2015) used a descriptive technique to analyse the impact of financial resources on the implementation of GPP in international tea companies in Kericho. The expense of obtaining recyclable items, the securing of bio-gradable items, the acquiring of environment friendly goods and the buying of non-ozone exhausting substances were factors considered inside the chosen firms. An overall Pearson correlation of 0.718 was obtained between financial resources and implementation with a p-value of 0.023 indicating that there is a high positive relationship between these variables. A standardised Beta coefficient in the regression model was significant and clarified 42.6 percent of the change in the model. The study recommended that multinational tea companies should provide financial support for adopting green purchasing.

A study was conducted in Thailand by Ninlawan, Seksan, Tossapol, and Pilada (2010) on the state of green activities in personal computer parts makers. They collected data from 11 manufacturers using a questionnaire method to measure the Green SCM (GSCM) practices, GSCM performance and GSCM pressures/drivers. Both environmental and positive economic elements were found to be significant factors of GSCM performance. Testa, Iraldo, Frey, and Daddi (2012) surveyed the elements that impact the consideration of green criteria in public bids using qualitative data on a sample of 156 public institutions from three Italian regions gathered by a standard poll. Researchers conducted tests on variables such as availability of toolkits, level of awareness, adoption of certified environmental management systems and the use of external expertise. The logistic model and the Orbit model showed that the level of awareness in GPP initiatives and toolkits is highly critical in defining the choice to embrace sustainable purchasing and the number of bids that are approved with the integration of environmental standards.

The comprehension of real estate developers in embracing GPP and the challenges faced in real estate development inside the setting of Chinese real estate were analysed by Shen, Zhang and Long (2017) using a classified cluster analysis technique. The research revealed that real estate developers in Chongqing China did not know about sustainable purchasing and green building materials. The most significant obstacles contributing to a little understanding of sustainable purchasing was lack of incentive policies, minimal marketing benefits, technical concerns with utilising green building supplies and a shortage of green building material in the local market.

An analysis on the behaviour of buyers when choosing green criteria in public purchasing was conducted by Testa *et al*. (2012). The analysis focused on where and how purchasers scan for data and what techniques they pursue when considering which environmental criteria ought to be utilised in choosing providers. The researchers utilised a mixed strategy technique strategy to gather information from participants. The outcomes of the analysis revealed that there are three specific contextual factors that can influence a purchaser's behavior: a buyers's work-related position, the nature of purchasing project and organisational size. Purchasing personnel that serve as departmental project champions are motivated to refer to internal and external data sources to a greater degree than purchasers without such obligations. They resolved that at least no less than four operational procedures can be connected with explicit heuristics from the intuitive writing: acknowledgment, accessibility, impersonation heuristics, and satisficing.

Diabat (2011) conducted a study on the elements that regulate the incorporation of green public purchasing in the public sector at Kenya Pipeline Company (KPC). It was centred on the following variables: the organisation's green capacity; the cost of green products; the organisation's green incentives and pressure; and the green supply capacity. They utilised a semistructured poll to gather data from purchasing personnel working at KPC. Correlation analysis and regression techniques were used to analyse the data in IBM SPSS. The organisation's green capability, and incentives and pressures were the main determinants of GPP adoption at KPC. The results revealed that the correlation coefficients are more than 0.7, implying that there is a solid positive connection between model dimensions. The expense of green items and green supply capacity were not observed to be considerable. The findings further recommend the need for an institution to apply effective training and awareness in its staff to improve the managerial and regulatory capability of the Public Purchasing Oversight Authority, to make GPP part of the performance measure and to align financial and legal policies to augment quicker GPP interest in the private sector.

Arisa and Muturi (2016) investigated the constraints that influence the implementation of GPP in Kenya using the descriptive research technique approach. The research was based on the following variables: internal organisation structure, initial cost of green products, information and technology, and technical management capacity. A multiple regression analysis was used to test the influence of predictor variables on the implementation as the dependent variable. The probability value of $p = 0.000$ shows that the regression relationship was extremely critical in forecasting how internal organisational structure, initial cost of green products and technical

management influences the implementation of GPP in public institutions in Kenya. The study established that the social implication of the production process, the cost of green products and the limited design and technology influenced the implementation of GPP to a great extent. The study recommended that a proper job description be put in place, the formulation of law on sustainable purchasing policy, better communication channels by the government, and training programme.

Ninlawan *et al*. (2010) conducted investigations into the factors that facilitate the successful implementation of green purchasing in the manufacturing industry of Zimbabwe. They studied how staff competence, supplier participation and Information Communication Technology (ICT) infrastructure affect the implementation of green purchasing using a stratified random sampling technique. Their findings concluded that workforce competence, supplier involvement and ICT infrastructure substantially affect the implementation of GPP. The study recommended that the national and local government should initiate the implementation of a GPP strategy in the entire manufacturing industry by drafting and implementing GPP policy enforceable at a legal level.

2.7.1 Leading International Initiatives

According to OECD (2011), many of the developed countries, for example Canada, Japan, the United Kingdom, Sweden, Austria, Finland, Denmark, Germany, Cyprus, France and the Netherlands, and multinational companies such as Interface Incorporated and Sharp Corporation have adopted sustainable purchasing successfully, showing improvements in environmental impacts as well as economic savings based on the life-cycle approach. There has been successful sustainable purchasing initiatives launched around the globe. Most of these initiatives are focused on developed countries. There are several reasons that influence the implementation of GPP initiatives in developed countries. As indicated above, developed countries have initiated several effective strategies and initiatives in sustainable purchasing. South Africa as a developing country can learn a lot from these initiatives and positively improve on the implementation of GPP. Examples of sustainable purchasing initiatives from North America, the UK and Europe are outlined below.

The government of Canada implemented the pollution prevention programme in 1995 through strengthening legislation and regulations with the private sector and communities. The federal departments also took steps in driving progress in managing waste, water and energy conservation.

A greener energy purchasing agreement was signed between Natural Resources Canada, Environment Canada with the Alberta Energy Company. They also developed a greener supplier database to assist organisations when procuring products using the first purchase strategies (Canada, 2010).

The DEFRA in the United Kingdom (UK) publicised a compulsory prerequisite in 2003 for all new government department contracts to conform to stipulated environmental principles. Another initiative from the UK is a guide composed by the Improvement and Development Agency (IDeA) to assist local authorities combine environmental concerns into procuring practices. (European Commission, 2008). The UK government also launched the EU Energy Efficiency directive in 2014 that requires public sector bodies to comply with the energy efficiency standards. The greening government commitments covers carbon emissions, sustainable purchasing and resource use. The UK Government has purchasing Standards (PS) that are obligatory for focal government offices and interrelated associations to use. The Greening Government: ICT approach was set up in 2011 and meant to handle costs and convey productive green practices. (European Commission, 2008).

In July 2010, the Austrian national government effected a straight activity plan for sustainable purchasing which emphasises the significance of modifying production and consumption plans towards sustainable activities. The activity plan includes environmental criteria for 16 comprehensive purchasing classifications which are utilised by the Federal Purchasing Agency which is the public sector's major central purchasing body in Austria, per guidance of the Ministry of Finance (Hidson, 2017).

The Ministry of the Environment in Denmark has the following three main initiatives to promote green purchasing in Denmark:

- The Forum on Sustainable Purchasing which is a forum for sharing knowledge on purchasing best practices with other buyers from both public and private.
- The Partnership for Green Public Purchasing which is a joint effort between leader municipalities, regions and other public associations who are focused on reducing environmental impact from their purchasing trends and drive the market in a greener way.
- The Responsible Procurer which is a webpage where buyers can find green criteria costs.

The Ministry has also launched a national task force on GPP to assist the government to implement sustainable supply programmes; developed tools to calculate the TCO in public purchasing; establish an annual event on green purchasing called the sustainable purchasing week and bring in further knowledge and experiences through participation in different GPP projects both nationally and internationally.

The Finnish Government introduced a resolution that was developed to decrease the environmental impact and climatic impacts caused by the central government, regional governments and the municipal sector (European Commission, 2014).

In Germany purchasing personnel are basically compelled to demand an analysis of minimised life cycle costing (LCC) by bidders in agreement with the new version of the German Regulation of Purchasing (VgV). Germany has 55 signatories to the Covenant of Mayors (CoM) all of which have submitted a SEAP (European Commission, 2004).

The Swedish government got different exercises including the establishment of the Committee for Ecological Sustainable Purchasing (1998-2001) which was given the task of advancing GPP in Sweden and impacting the European Union to consolidate green objectives in the EU acquisition orders. The Swedish Environmental Protection Agency is responsible for monitoring and developing the environmental policy that promotes sustainability in Sweden. The GPP covers areas such as the acquisition of personal computers that are energy resourceful, environmentally friendly office equipment produced from sustainable wood, biodegradable paper, electric autos and carbon-based food in cafeterias. The government also established an environmental management council which drives GPP by providing environmental criteria, expertise and information. In a poll that was conducted half of the Swedish public bodies stated that they utilise the Environmental Management Council criteria to green their purchasing (European Commission, 2009).

The Department of Public Works of the Ministry of Infrastructure and the Environment in the Netherlands developed a tool by the name DuboCalc that calculates the environmental impact of construction materials as part of the performance-based bidding procedures. The carbon monoxide performance ladder is an accreditation framework which a bidder uses to demonstrate the measures to be taken to limit carbon monoxide discharges. The Professional and Innovative Biding, Network for Government Contracting Authorities was set up to professionalise purchasing and bidding in all administration offices with a perspective on enhancing proficiency and to encourage dialogue

between public contracting experts and private sector organisations. It is a part of the Dutch Ministry of Economic Affairs and Climate Policy (European Commission, 2009).

2.8 South African Context

The former president of the Republic of South Africa in his address to a gathering at the Green Economy Summit held in Johannesburg in 2010 said the following, "Through our actions, we need to respond to the notion that there is a trade-off to be made between faster economic growth and the preservation of our environment." The former president called upon all stakeholders, industries, and green technologies to assist South Africa to take action on climate change and global warming adding that government supported the creation of jobs through environmentally friendly initiatives. His presence at this gathering reflected that the South African government supports sustainable purchasing (Scoop, 2010).

Agyepong and Nhamo (2014) conducted a study on climate change and sustainable development. They used the interview and document analysis method (Creswell and Plano, 2007). Information was gathered and analysed from various documents such as sustainable purchasing implementation strategies, waste management policies, sustainable purchasing guidelines, environmental policies, integrated development plans and SCM policies. Their study concluded that even though all the four metropolitan municipalities had their own purchasing policies in place, the only municipalities that had incorporated sustainable purchasing strategies into their SCM were eThekwini and the City of Cape Town metropolitan municipalities. It was also found out that NMBM and The City of Cape Town municipalities are the only metropolitans with stand-alone green purchasing policies in South Africa.

Rogerson and Sims (2012) published an article on greening of urban hotels in South Africa. The study interviewed the following two institutions:

i. Associates of the "Green Building Council of South Africa", which is the national regulatory body for development of green construction or sustainable buildings;
ii. The Heritage Environmental Management which is a critical certification agency and also a partner of the Green Globe brand.

The findings of this investigation of urban hotels in Gauteng confirmed previous results about the "low level of support for responsible tourism initiatives in the hotel industry" by Van der Merwe

and Wöcke (2007). The inner-city hotels in Gauteng only embraced greening practices that improved revenue. The greening is motivated by the vision of management echelons and by individual hotel managers. Seif (2011) explains that the cost, age of a hotel and market segment also played an important role in driving the green initiatives with one of the respondents admitting that whilst green initiatives were critical, it was not significant when compared to such issues as the contentment, safety and security of their customers. The other important constraint is lower awareness among the local customers and demand for green hotels in South Africa.

An observation of organisations regarding the effect of green practice implementation on the business capacities were analysed by Smith and Perks (2010). A self-directed survey was completed by 298 owners, supervisors and staff in companies inside the NMBM. The term "green businesses" is defined by Smith (2003) as "businesses and practices that are viewed as environmentally sound, including the use of organic and natural products to build factories, tighter protection against emissions and environmentally friendly sourcing of materials". The researchers conducted the ANOVA test to establish the relationship between the independent variables; size of business; type of industry; functional area employed; position occupied; experience with green practices; cultural group and age with the dependent variable and perceptions of the impact of green practice implementation on the business activities. Smith and Perks (2010) discovered that functions such as information technology, finance, SCM and general management are the least roles that are impacted by GPP. They also elucidate that business functions such as operations, manufacturing, sales, marketing, distribution and logistics are the most impacted by GPP practices.

In an article on green economy readiness of South Africa, Nhamo (2013) explains that institutions that have invested substantial resources into sustainable development would be able to tackle GPP. He further commends the progress that South Africa has made towards allocating resources on sustainable development programme. He concluded that while significant improvement has been realised concerning sustainable development further work needs to be done in areas such as organisational capacity, green funding, establishment of policies and training and awareness on green purchasing.

Nhamo (2013) commented that eThekwini municipality was facing resource challenges and the capability to gather different stakeholders under one roof to confront the issue of climate change although they managed to host a Climate Change Adaptation Strategy in 2006. This was done to

recognise sectors that would be affected by gradual climate change and highlighting the suitable and practical adaptation alternatives. The strategy reviewed sectors such as sanitation, the coastal zone and biodiversity. To address environmental change difficulties, the municipalities's Environmental Planning and Climate Protection Department empowered and bolstered three pilot sectors to create and comprehend their own municipal adaptation plans.

Bolton (2008) researched the incorporation of environmental considerations in the existing legislations in South Africa. Bolton examined factors such as the inclusion of green specifications in bids, responsibilities of contractors, matching of bids, Eco labels and ensuring that the environmental aspects are always taken into considerations when bid specifications are designed. The paper by Bolton (2006) aimed to demonstrate that state owned entities in South Africa can utilise purchasing as a policy document to contribute towards GPP development as they have previously done so in the past to deal with historical policies that are discriminatory. The paper further recommended that environmental criteria must be used as part of disqualification for bids that do not have consideration for the environment. The paper concludes by recommending that environmental criteria can be used as part of decision making in the awarding of the bid provided that bid specifications are precise, quantifiable and are clearly articulated in the bid specification document and are consistent with local government SCM legislative framework.

Windapo (2014) conducted investigations of the main drivers of green building in the Western Cape Construction Industry of South Africa. Interviews were conducted with experts (Architects, Mechanical engineers, electricians and quantity surveyors) who were part of construction of each certified building by the Green Building Council of South Africa. The data was then analysed using a thematic analytical method categorising main themes and subthemes. The study reported that main drivers of green building are monetary rather than environmental. It also concluded that a sound business case was vital when considering construction of green buildings because few customers would consider building a green building for a sole purpose of environmental compliance. It was further recommended that the South African government must consider implementing legislative instruments in building regulations to support green building design and construction.

2.8.1 Leading South African Initiatives

Department of Economic Development in Gauteng and the City region formed a collaboration in August 2011 which led to the publication of a green document that seeks to meet the expectations of the Gauteng Provincial Government to prioritise the move towards green technologies, green energy and creating employment opportunities as pronounced in the GEGDS. The 2009-2014 Medium Term Framework programme of action undertook to promote responsible use of energy in the economy by using eco-friendly goods and services to support the creation of green jobs and to reduce environmental impact on the climate. Across Gauteng Provincial departments and local government, there are already a few projects happening that shows some seriousness about the implementation of GPP such as:

1. The Greening Soweto initiative that was launched in September 2006 with planting of 6 000 trees in 10 minutes with the help of 12 000 learners as shown in Figure 2.1. The project was aimed at reducing the emissions of CO_2 while promoting urban habitability and sustainability. Urban trees or urban greening have significant potential to mitigate the net effects of global warming and climate change. Through the process of photosynthesis, trees absorb and convert atmospheric CO_2 and water into glucose and organic compounds using energy from the sun (Lal, 2008).

*Figure 2.**1**: Greening the City of Johannesburg (Source: City of Johannesburg, 2015b)*

The vision of the "Greening Soweto" initiative by Johannesburg City Parks was to transform the dry, dusty streets and landfill sites that characterised Soweto and many black South African townships during the apartheid regime to award winning parks with a variety of ecological services (Johannesburg City Parks, 2012).

2. Green Transportation: Rea Vaya - Bus Rapid Transit system

Rea Vaya which signifies "we are moving" offers quick, secure and inexpensive public transport on a network of bus routes across Johannesburg (Figure 2.2). The project is aimed at reducing CoJ's public transport carbon foot print. The fleet is one of the most contemporary available, with state-of-the-art engineering to make sure carbon emissions are very low.

The project includes broad endeavors to integrate a wide scope of other services including feeder vehicles, pedestrian walkways and bikes.

*Figure 2.**2**: Rea Vaya Bus Service (Source: City of Johannesburg Transport department, 2010)*

According to City of Johannesburg (2017), a research was conducted on Rea Vaya capabilities and results showed that if more people used Rea Vaya services as much as 1.6 million tons of CO_2 emissions in the CoJ could be reduced. This project is one of the largest initiatives undertaken by the CoJ on its quest to mitigate on pollution, traffic congestion and socio- economic challenges. The city managed to convert over thirty buses

reducing emissions on buses by over 20 percent on the average distribution of percent diesel (City of Johannesburg, 2017).

3. Integrated Waste Management: Separation at Source

   Residents in particular serviced areas are provided with recycling bags every week by Pikitup (Figure 2.3). The project aims to encourage residents to practice waste recycling and to create jobs by facilitating monetary rewards in return of recyclable waste (City of Johannesburg, 2017).

*Figure 2.**3**: Waste separation at source (Source: Pikitup, 2014)*

4. Water Management: Lanseria Reservoir – Johannesburg Water SOC's venture of developing another 20ML water repository and a 1.2ML water tower in Lanseria with a value of R39.5 million (City of Johannesburg, 2017).
5. Landfill gas-to-power project aims to provide 3MW of renewable electricity to more than 5 500 homes in Johannesburg. The project is based in Robinson Deep landfill site. It is one of the largest projects of its kind worth over approximately R130 million. Figure 2.4 shows the first South African landfill gas to power project. The facility will deliver an extreme 11 MW of sustainable power source which could lessen the city's carbon footprint by around 459 034 metric tons per year by supplanting power produced from petroleum derivatives (City of Johannesburg, 2017).

Figure 2.4: South Africa's first independent landfill gas-to-power project (Source: Infrastructure news, 2016)

2.8.1.1 Western Cape Provincial Government

The Department of Environmental Affairs and Planning in the Western Cape has drafted a green paper which is aiming to bring consciousness and inspire environmentally friendly practices between the residents and contractors. The paper was drafted within the framework relating to public purchasing practices at national and provincial levels respectively (Western Cape Government, 2017).

The province's initiatives include:

- Climate Change Strategy.
- The 2Wise2Waste programme.
- The Provincial Hotel Greening pilot project.

In addition, the green paper policy document will guarantee that the administration's environmental footprint is decreased by supporting resource efficient operations. Another initiative is to encourage suppliers/service providers to consider environmentally friendly goods without compromising preferential purchasing practices. Section 3.4.14 of the green paper states that the sustainable purchasing requirements should be defined in the tender specification advertisement to persuade service providers to observe requirements. Section 4.1 of the paper identifies the importance of establishing a thorough performance management system at all spheres of government and at

management and individual staff level to encourage the adoption of the policy document (Western Cape Government, 2017).

2.8.1.2 Nelson Mandela Bay Municipality

NMBM in 2011 created a strategy on the implementation of GPP with an emphasis on the importance of managing natural resources more efficiently and effectively to improve the quality of life of its residents as well as job creation and health (Arcus, 2010). The strategy at the NMBM is that suppliers are encouraged to evaluate their environmental performance, thereafter if they qualify they are awarded a green certificate which qualifies them to be on the green database.

The NMBM also launched a Go Green Campaign aimed at communicating municipal initiatives that conserve natural resources. Some of the green initiatives in NMBM include:

1. The NMBM Stadium (Figure 2.5) which operates with an Environmental Management System (EMS) with the primary goal of making a sustainable and responsible use of natural resources in order to minimise negative environmental impacts.

Figure 2.5: Nelson Mandela Bay Stadium (Source: Beka-schreder, 2010)

Some of the NMBM's energy efficiency projects are:

- They supplanted the current traffic lights with energy proficient light bulbs.
- They supplanted the current 125 mercury vapor lights on small streets in Nelson Mandela Bay with 57 Watt Compact Fluorescent globules (CFLs).
- They are leading a study into the utilization of Light-Emitting Diode (LED) hotspots for real street lighting.

- They have changed the lighting systems in municipal infrastructure to be more energy effective (Auto sensor lighting frameworks have been introduced).

2. A new initiative which is the first of its kind in a municipality in South Africa called Small Scale Embedded Energy Generation (SSEG) has been initiated. This project enables industry and houses to generate power utilizing sustainable power source innovation (wind or sun powered PV). The renewable power source created is then fed back into homesteads or commercial buildings for its energy demands and the additional is fed back into the grid.
3. The Waste Exchange (WX) project was propelled in 2008, as one of the waste minimisation ventures of the Integrated Waste Management Plan (IWMP) of the NMBM.
4. In 2010, the All Hands on Waste project (Phase 1) was introduced and it urged people to clean their environment and to be aware of their waste (Figure 2.6).

Figure 2.*6: All Hands-on Waste campaign (Source: NMBM Municipality, 2009)*

5. In 2009, NMBM started the Zanemvula housing project shown in Figure 2.7 in which 1200 solar water heaters were installed on the roofs of homes in Chatty extensions 3, 4 and 6. The project aimed to support renewable energy projects.

Figure 2.7: The Zanemvula housing project (Source: Housing Development Agency, n.d.)

2.9 Conclusion

As indicated above, several developed countries have initiated several effective strategies and initiatives in green purchasing for sustainability. The initiatives aim to reduce the emission of carbon monoxide which causes climate change and global warming through creating innovative ways of generating energy with less pollution. The pollution prevention programme and the greener energy purchasing agreement in Canada are examples that the government of Canada supports pollution prevention activities. Locally, the CoJ launched the Smart city project and the Rea Vaya bus transit system which are aimed at reducing the public transport carbon footprint with minimal emissions of carbon monoxide.

Existing research shows that organisational structure, initial cost of green products and technical management influences the implementation of GPP in public institutions (Arisa and Muturi, 2016). The logistic model and the Orbit model developed by Testa *et al*. (2012) indicated that knowledge of GPP initiatives and tools is highly important in determining the choice to adopt green goods and services. Agyepong and Nhamo (2014) concluded that the City of Cape Town and eThekwini Metropolitan Municipalities were the only ones that have integrated sustainable purchasing strategies into their SCM despite the fact that all Metropolitan municipalities have SCM policies

in place. NMBM also emerged as the only one with stand-alone sustainable purchasing strategy. The presented evidence forms the basis for analysing and deliberating the research findings in Chapter 4.

3. RESEARCH METHODOLOGY

3.1 Introduction

The purpose of the research was to determine factors that lead to non-implementation of GPP practices in the CoJ. The research seeks to respond to the following questions: (1) To what degree do CoJ management practices decide how GPP policies are implemented? (2) To what extent does the cost of green products affect the CoJ's adoption of GPP practices? (3) To what degree do bid specifications influence the implementation of green products in the CoJ? (4) What is the level of awareness and training on sustainable purchasing policies and procedures in the CoJ?

This study utilised the survey method which focused on cost of green products, management practices, training and awareness and bid specification. The literature reviewed techniques and methods used by different institutions to establish the variables that affect implementation of GPP. The discussion in this chapter is structured according to the following sections: Research design; Data collection; Measuring instrument; Population; Sampling; Measurement model and Data analysis techniques; Delimitations; Ethical considerations and lastly Conclusion.

3.2 Research Design

Leedy and Ormrod (2013) describe research design as a map for a study to be undertaken, postulating the general framework for gathering information. MacMillan and Schumacher (2001) explain it as a blueprint for choosing subjects, study sites and information gathering processes to respond to the research question(s). To answer the research questions, this study used a quantitative research strategy.

To give direction to this study, a positivist approach was followed. This study generated hypotheses and research questions that can be tested and measured against acceptable knowledge of GPP in the CoJ. According to Gerring (2007), the positivist approach generates a body of research that can be repeated by other scholars to produce similar outcomes. The emphasis on this study will be on scientific results that would be subject to statistical analysis.

3.2.1 Quantitative research approach

Quantitative study is undertaken to respond to questions about associations on measured variables, with the idea of describing, forecasting and controlling phenomena. It relies on statistical data to test the associations between two variables (Leedy and Ormrod, 2014).

Hair, Black, Babin and Anderson (2014) point out that quantitative method approach is more concerned with statistical principles for the validity of a method such as the number of respondents that would be required in a study to determine statistical significance. They further explain that Quantitative method is apprised by a positivist philosophy and it is applicable when investigating a variety of social facts such as subjective viewpoints and feelings.

Maree (2007) points out that telephonic interviews, mail surveys, individual interviews and questionnaires are methods generally used when gathering information. Leedy and Ormrod (2014) refer to quantitative research methodology as a technique intended to determine the frequency and supply of specific characteristics in a populace; particularly in corporate, sociology and government studies.

The measuring instrument that will be used in this research will be a research questionnaire. Surveys will be dispersed to targeted participants. The research instrument will measure the relationship between these variables: cost of green products, management practices, training and awareness and bid specification. Variables will be quantified by using a Likert scale with five categories, namely: (1) Strongly disagree (2) Disagree (3) Neutral (4) Agree (5) Strongly Agree.

3.3 Data Collection

Data collection plays a major role in the research design. This research adopted a survey technique approach to collect primary data. Wilkinson and Birmingham (2003) state that “surveys involve choosing a representative and impartial sample of subjects drawn from a group that would be studied”. The key methods of asking questions are conducting interviews, telephonic interviews, live interactions, surveys or a combination of all.

Surveys are well known fundamental instruments for collecting data on public knowledge and perception of a target group. Utilising a survey empowers the researcher to categorise the questions and get answers without really conversing with each respondent. There is also no subjective influence of the researcher and humiliating questions can be solicited with a reasonable shot from getting a genuine

answer. Check and Schutt (2012) describe research surveys as an instrument for gathering data from a sample of individuals through their responses to various survey questions.

3.3.1 Measuring Instrument

A survey instrument was designed on a five-point Likert scale: Strongly Agree = 5, Agree = 4, Neutral = 3, Disagree = 2 and Strongly Disagree = 1 to determine the correlation and attitudes (Saunders, Lewis and Thornhill, 2012). This was sent to targeted procurement personnel, management and executives using Google Forms. According to Cooper and Schindler (2014), "email offers greater control because most users read and respond to their own mail in their personal time".

The first section of the survey concentrated on the demographics of the respondents. The second part of the questionnaire focused on management practices. The third part was concerned with the perceptions on the cost of green goods and the fourth part covered training and awareness. The fifth section focused on bid specification perceptions whilst the sixth part focused on sustainable purchasing. The research survey comprised of closed ended questions. The sample survey is provided in Appendix A. The responses collected were captured in Microsoft excel and then imported into the latest statistical package namely IBM SPSS for data preparation and analysis. The responses were then coded and assigned values from 1-5, with 1 representing strongly disagree and 5 representing strongly agree.

3.3.2 Population and Sample Size

The sample size of this study was 100 targeted procurement personnel from all fifteen CoJ departments. This sample size was appropriate because all CoJ department comprise of six procurement staff as per the CoJ official organogram. The study targeted all six relevant procurement staff in each department, and this made it possible to generalise the results of the population of CoJ procurement staff. The targeted procurement personnel varied from administrative officers, operational managers, deputy directors and directors.

3.3.3 Sampling techniques

The non-probability sampling technique was used in this study. In non-probability sampling, researchers are assisted by groups of sampling methods to choose units from a population that they

are intending to study. The type of non-probability study that was used in this research was the "convenience sampling" style which is a process whereby units that are chosen for inclusion in the sample are the easiest to retrieve (Laerd, 2012). The targeted respondents were procurement personnel which are in one building, therefore it was easy for the researcher to access them for further clarifications. Convenience sampling is simple, straightforward and it guarantees that results are representative and generalisable of research findings to a related population.

3.4 Data preparation

Descriptive statistics including frequency tables, cross tabulations, graphs and charts were compiled to provide a high-level understanding of data. In order to measure the variables of management practices, cost of green products, training and awareness, and bid specification, composite scores for each variable were calculated per respondent. All the variables in this research were based on survey results and to overcome common method bias the researcher used a Harman's single factor test to check for bias (Chang, Witteloostuijn and Eden, 2010).

The reliability of the instrument was calculated using Cronbach's alpha to establish the internal dependability of the instrument. To test validity of the instrument, "principal component analysis" with an orthogonal rotation and varimax rotation on all items of the variables in the study was conducted. Kaiser's rule of factors with eigenvalues larger than 1 remained in the instrument. Factors lower than the cut off of 1 were excluded from the study. The decision to exclude factors was based on scree plots which were used to complement the eigenvalue scores. The rotation of factors ensures a simpler interpretation of each factor.

3.5 Measurement Model and Data Analysis Techniques

3.5.1 Reliability Testing

According to Hair *et al*. (2014), reliability is the degree to which a variable or set of variables is dependable in what it is aimed to evaluate while Quinlan, Babin, Griffin and Zikmund (2015) maintain that reliability is an indicator of a measure's internal reliability and dependability of the research to which the research can be repeated while obtaining stable results. Cronbach's alpha was used to calculate the internal constancy of the instrument. Leedy and Ormrod (2014) pointed out that internal consistency is the extent to which all of the items within a single instrument produce similar results. According to Bryman and Bell (2015), "Cronbach alpha is a commonly used tool to test for internal reliability which essentially calculates the average of all possible split-

half reliability coefficients and it varies from 0 (denoting no internal reliability) to 1 (denoting perfect internal reliability)". A high value of Cronbach's alpha (0.80 and above) signifies that the items are measuring the underlying (or latent) construct.

3.5.2 Validity Testing

This research utilised the principal component analysis to test validity, which is one of the most established and surely understood strategies of multivariate analysis. The customary factors (occasionally called inactive variables) are hypothetical variables that clarify why various factors relate to one another. Principal component analysis has the following common aims: to scrutinise inter- correlations of a huge number of variables by clustering them into ordinary factors such that variables within each factor are extremely interconnected and to deduce each factor according to the variables with high loadings. The technique finds the dimensions that account for the variability in a space outlined by the variables, it rotates the factors to obtain a simple analysis and hypothesises a factor score for each case.

3.5.3 Canonical Correlation analysis

According to Hair *et al*. (2014), "canonical correlation is a process that seeks to identify and quantify the interrelationships among sets of multiple criterion variables and multiple predictor variables". This study performed a canonical correlation analysis technique.

IBM SPSS syntax was used to execute a command for MANOVA and the subcommand/ discrim. The MANOVA (multivariate investigation of variance) is a type of multivariate examination used to break down information that comprises of more than one ward variable at any given moment. The independent variables were included in one single factor separating the dependent variable by the WITH command. The order of variables in the MANOVA command comprises of the dependent variable first followed by the independent variables.

In this research the dependent variable is the implementation of GPP against the following independent variables: management practices, cost of green products, awareness and training, and bid specification. The subcommand/ discrim produces a canonical correlation analysis for all covariates. Before a canonical variable is extracted, ALPHA specifies the significance level required. The default is 0.25 and it is commonly set to 1.0 so that all discriminant functions are

stated.

3.5.4 Regression Analysis

Stanton (2001) states that "regression model is a statistical procedure that allows a researcher to estimate the linear relationship that relates two or more variables". In the regression model, the independent variable is the X variable, and the dependent variable is Y variable. The straight line interfacing any two factors X and Y can be communicated logarithmically as:

$$Y = a+bX$$

where *a* is the Y intercept (or the intercept), and *b* is the slope of the line.

3.5.4.1 The Assumptions of Linear Regression

Stanton (2001) points out that linear regression is a simple and generally used type of extrapolative analysis and the general idea of regression is to test two things: (1) if a set of predictor variables performs well in calculating results (dependent) variable (2) which variables are most important predictors of the result variable.

The following are the assumptions of linear regression that have to be met before performing the regression analysis:

- Linear Relationship: A linear connection exists between the independent and dependent variables. This assumption is checked by drawing a scatter plot.
- Multivariate Normality: This presumption can best be checked with a histogram and a fitted typical curve or a Q-Q-Plot. Familiarity can be checked with an integrity of fit test, for example, the Kolmogorov-Smirnof test.
- Multicollinearity: This assumption can be tested by computing the Variance Inflation Factor, Tolerance, correlation matrix and the condition index.
- There is no auto connection if the residuals are not independent. The Durbin-Watson's d tests the null hypothesis that the residuals are not linearly auto-correlated.
- Homoscedacity: The scatter plot is a great approach to check whether homoscedasticity, that is the error terms along the regression are equivalent. The Goldfeld-Quand Test can be used to test for heteroscedasticity.

The IBM SPSS software was used to execute the regression analysis with green implementation as

the dependent variable and management practices, cost of green products, training and awareness, and bid specification as independent variables.

3.6 Delimitations

According to Babbie (2015), "delimitations are choices made by the researcher in order to decrease the size of the study objectives, meaning that they are boundaries that a researcher set for their study". He further states that delimitations are interrelated to theory, research questions and population. By the time of conducting research the CoJ was going through the process of institutional review, hence the study focused mainly on 15 core administration departments of the municipality and avoided its entities. The researcher would have liked to include external stakeholders and collect data at different points in time and settings to determine the strategies that impact on the implementation of GPP and these would have included other metropolitan municipalities. The focus of the investigation was to determine factors that contribute to non-implementation of GPP within the CoJ metropolitan municipality.

3.7 Ethical Considerations

Babbie (2015) draws our attention to adherence to ethical issues especially when research involves interface with people, particularly in instances where there might be a conflict of interests. For this study the researcher obtained a letter of ethical clearance from the CoJ accounting officer to collect information across all CoJ departments. The researcher adhered to the research ethics of the University of Johannesburg. Leedy and Ormrod (2014) specify six types of ethical issues which are protecting respondents from harm, volunteering and informed involvement, right to confidentiality, integrity with professional coworkers, internal review boards and professional codes of ethics. The ethical clearance to undertake this study is provided in Appendix B.

3.8 Conclusion

Chapter 3 presented the research design; data collection; measuring instrument; population; sampling; measurement model and data analysis techniques; delimitations and ethical considerations. The chapter intensely explained methods and techniques utilised to check reliability and validity of the instrument, data reduction, canonical correlations and regression analysis. The gathered information will be analysed and reported in Chapter 4.

4. DATA ANALYSIS AND FINDINGS

4.1 Introduction

This section will present an analysis of the results of the factors that may affect the implementation of GPP in the CoJ municipality and it further summarises findings of the study in the context of literature reviewed in Chapter 2. Where applicable, comparisons and differentiations between this study and previous studies are identified. A comprehensive description of the research methodology was explained in Chapter 3.

4.2 Descriptive Statistics

Descriptive statistics forms an important part of any analysis since it is used to describe the basic features, show or summarise information in a significant way such that, for example, patterns might arise from the data. Microsoft excel was used to display graphs with descriptive statistics.

4.2.1 Gender Demographics

The survey was administered among 100 respondents. The gender distribution of respondents is provided in Figure 4.1. About 52 percent of the participants were females and 48 percent were males.

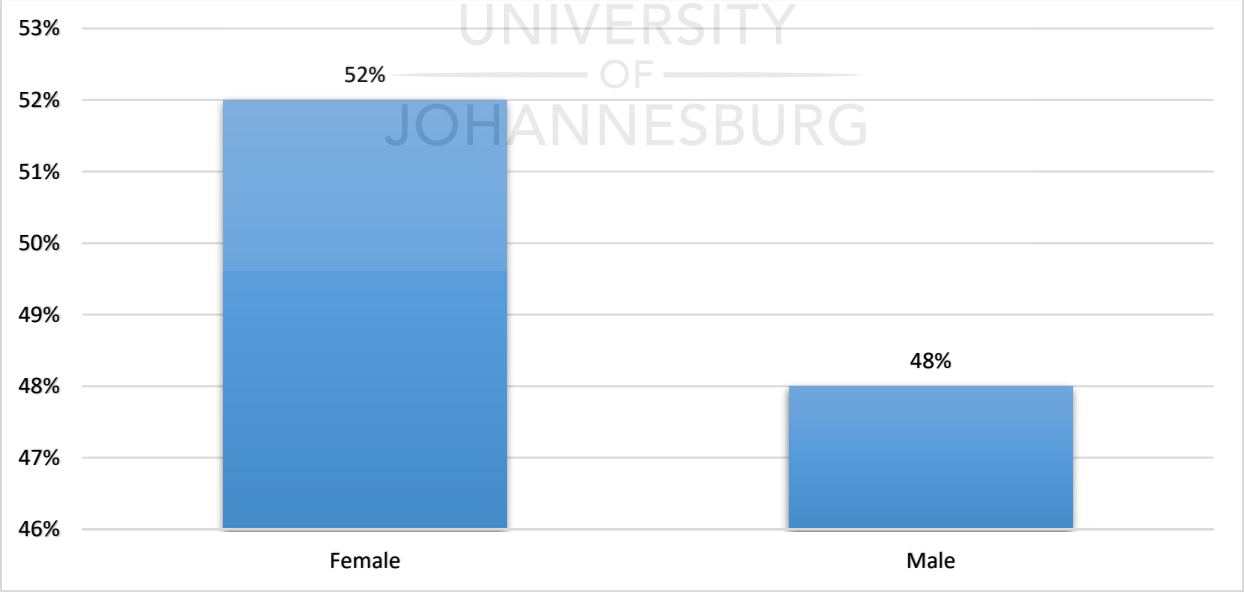


Figure 4.1: Gender demographics

4.2.2 Key Criteria on Organisation's Purchasing Decisions

Interviewees were asked to share their opinions on what they thought was the key criteria used in the council's purchasing decisions. 51 percent indicated that preferential purchasing policy is a key factor followed by black empowerment (23 percent) and price (18 percent) as shown in Figure 4.2.

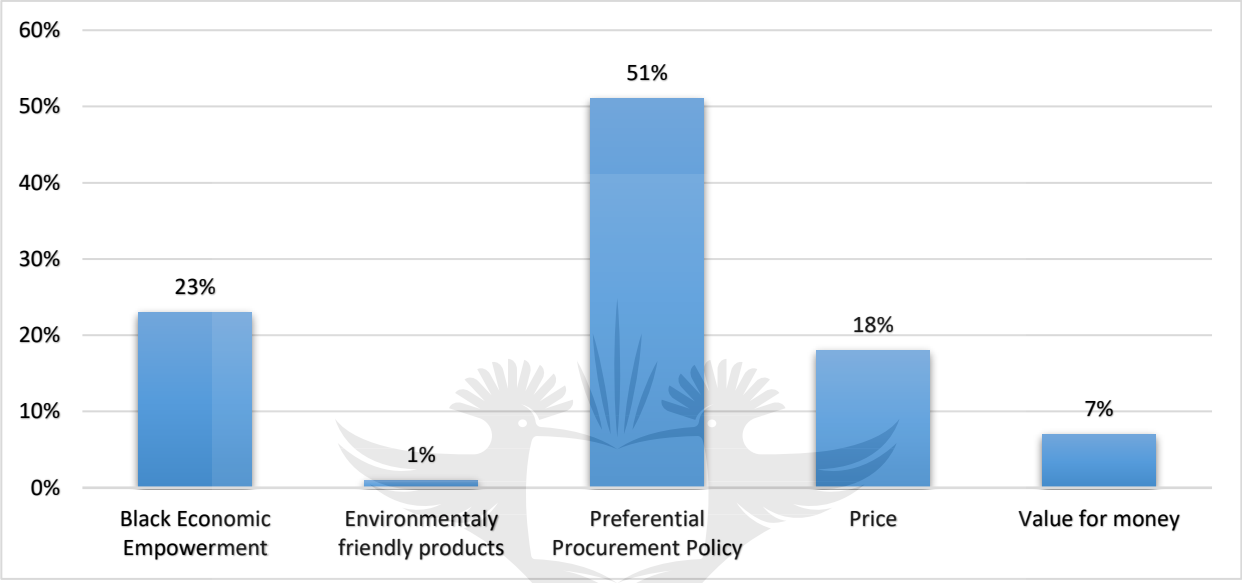


Figure 4.2: Responses on key criteria utilised in organisation`s purchasing decisions

4.2.3 Environmental Policy of CoJ Municipality

Participants were asked if they had knowledge of the existence of the environmental and sustainable purchasing policies in the CoJ municipality. The participants showed that they were knowledgeable of the presence of an environmental policy (60 percent) as compared to 31 percent who did not know. Only 9 percent indicated that the municipality does not have the policy as presented in Figure 4.3. The CoJ released the Environmental Management Framework in 2000. Regarding the knowledge of the existence of a sustainable purchasing policy, only 23 percent responded to yes and 49 percent of the participants did not know. The sustainable purchasing response is of great concern as it indicates a lack of consciousness on green goods. In his review regarding green purchasing, Friend (2009) explains that purchasing personnel must be trained and coached about the organisations' green policies in order to make them accustomed with the GPP trends.

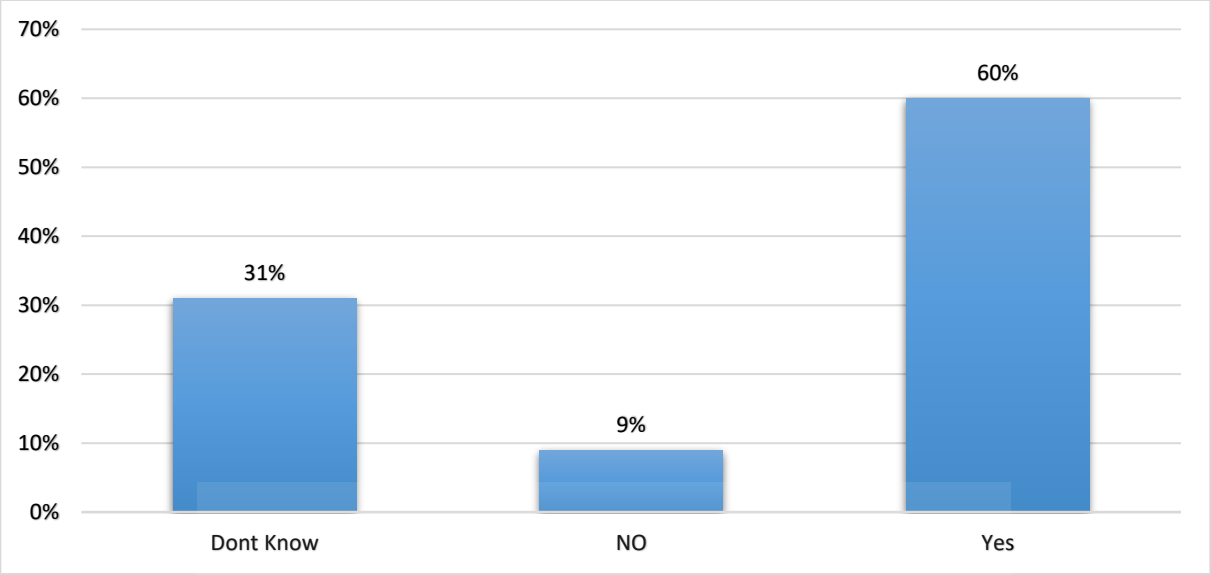


Figure 4.3: Responses on environmental policy of CoJ Municipality

4.3 Individual Analysis of GPP Components

4.3.1 Management Practices

4.3.1.1 Management Support and Promotion of Green Purchasing Projects

The participants were asked questions relating to management's influence on green implementation. Participants were requested to comment on whether management promotes and supports sustainable purchasing initiatives. 55 percent were neutral whilst 22 percent were in agreement and 23 percent of the responses disagreed as shown in Figure 4.4.

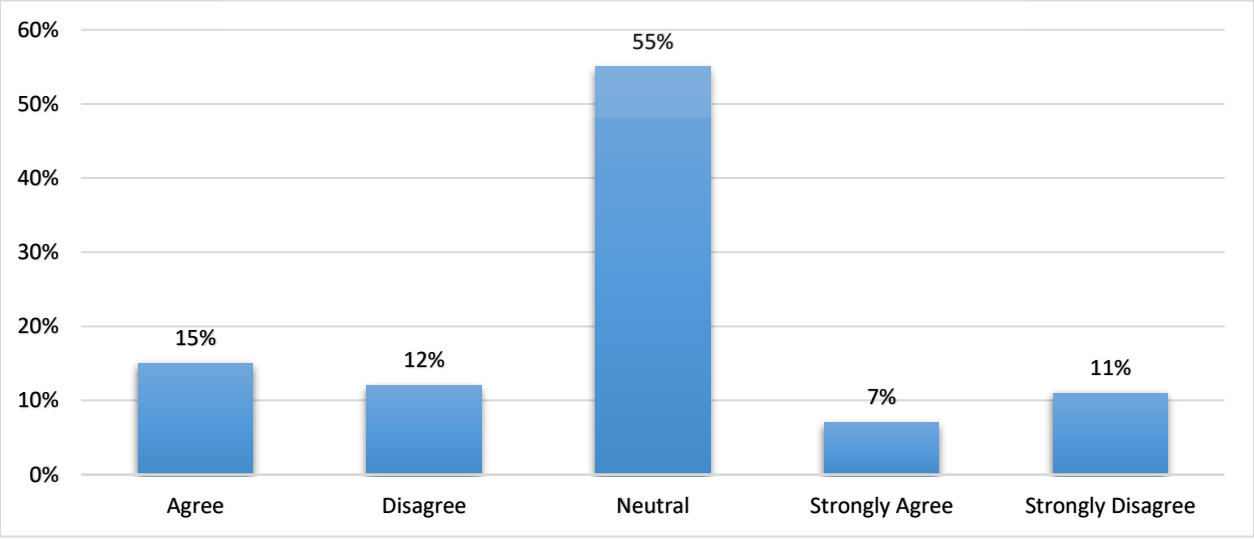


Figure 4.4: Responses on management support and promotion of green purchasing projects

4.3.1.2 Compliance on Environmental and Green Purchasing Policies

Participants were requested to share their opinions on whether management adheres to the environmental and sustainable purchasing policies. 53 percent responded with a neutral response whilst 26 percent did not think that management adheres to the policies compared to the 21 percent who agreed as shown in Figure 4.5.

Ji, Ma and Li (2014) concluded that dedication by top management was a key aspect for both GPP and green supplier development. Testa, Iraldo, Frey and Daddi (2016) also concur that support of senior executives is important as an internal driver of environmentally responsible purchasing.

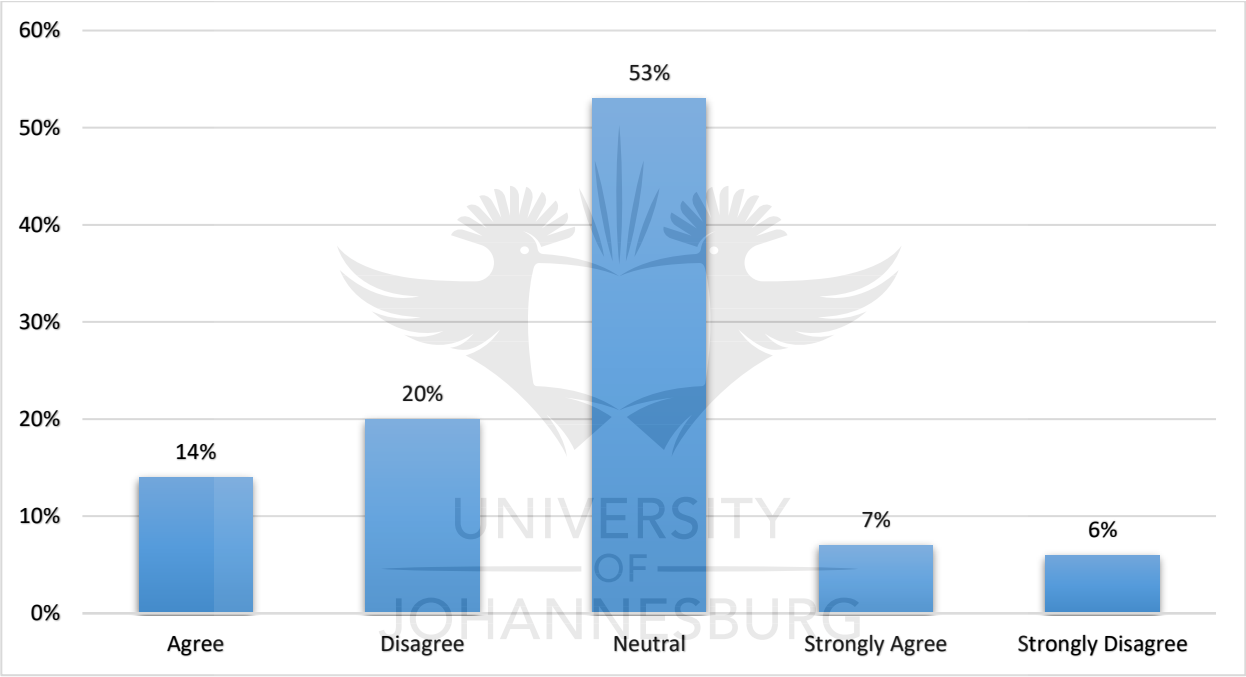


Figure 4.5: Responses on compliance with environmental and green purchasing policies

4.3.1.3 Transition process to GPP

The participants were requested to share their opinion on whether the transition to sustainable purchasing/environmental products and services was transparent. 47 percent responded with a neutral response whilst 32 percent indicated that the transition was not transparent compared to 21 percent who indicated that it was. Transparency in sustainable purchasing comprises of the following: creating purchasing guidelines; advance publication of purchasing strategies; publication of bid advertisements; disclosure of assessment criteria in bid specification documents; publication of contract awards and prices paid; instituting proper and suitable dispute procedures; creating a declaration of financial interest register for purchasing employees. A transparent

purchasing process increases competition, enhances efficacy and lowers the danger of injustice or exploitation as shown in Figure 4.6.

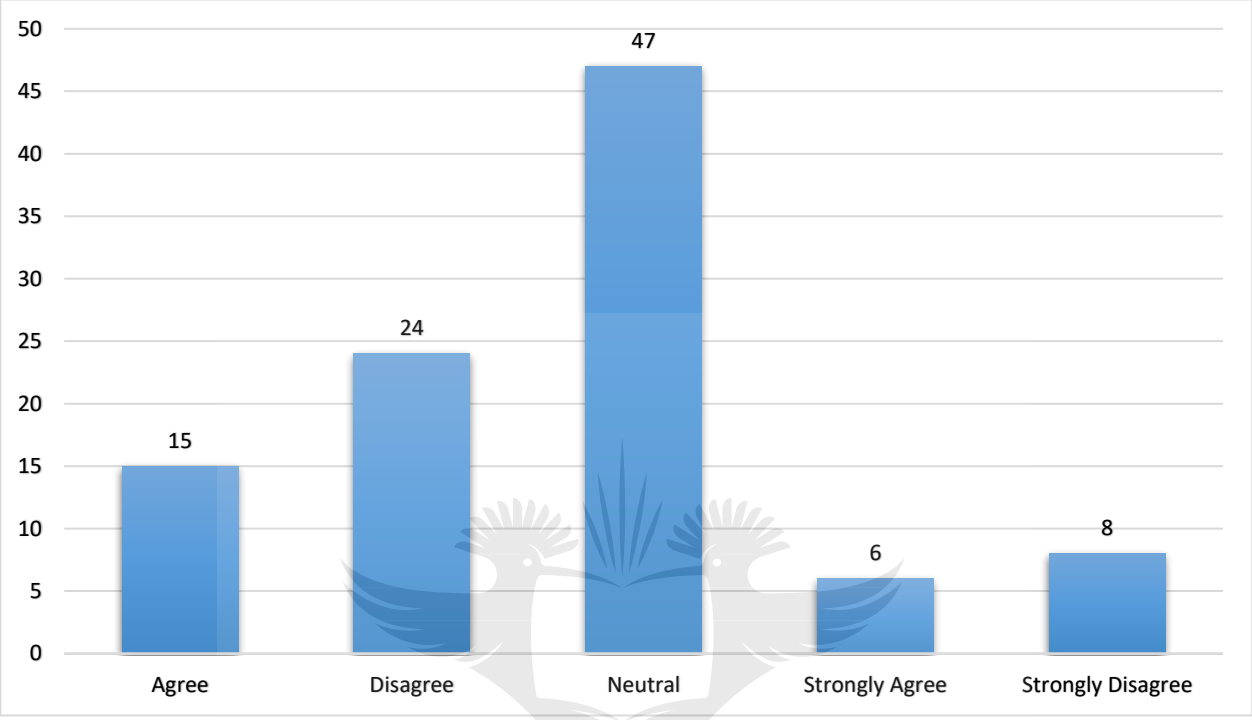


Figure 4.6: Responses on transition process into GPP

4.3.2 Cost of Green Products

4.3.2.1 Local green products cost implications

The participants were asked to share opinions on whether they feel that the cost of sustainable purchasing products is highly determined by availability and the majority (56 percent) indicated that the cost is determined by availability whilst 9 percent disagreed as presented in Figure 4.7.

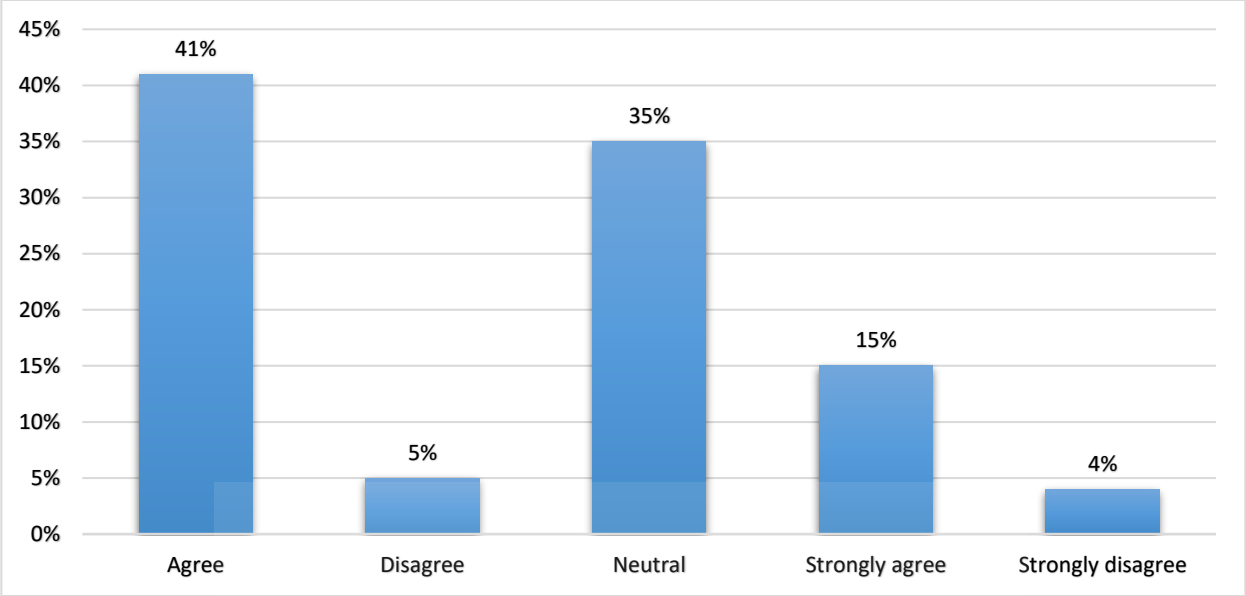


Figure 4.7: Responses on local green products cost implications

4.3.2.2 Costs of Green Products and Services

The research wanted to ascertain if there is a greater perception amongst the purchasing personnel that sustainable purchasing products are costly and the majority (52 percent) indicated that the products are costly as compared to 21 percent who disagreed as shown in Figure 4.8. RetailMeNot, one of the major digital companies that offers destination that assists consumers to save money conducted a survey between 23-27 February 2015 among 1023 U.S. residents aged 18 and over and established that 81 percent of the consumers think environmentally friendly items are more costly than non-green products (Prnewswire, 2012).

A publication by Cone Communications (2013) reported that a survey by global PR firm Gibbs and Soell indicated that 71 percent of US executives mentioned that reluctance by consumers to pay top prices was the main obstacle facing businesses that had an intention of going green.

Most buyers said that high costs were the greatest obstruction when shopping for green merchandise and buyers in the US, the UK, France, Germany and Australia generally concur with this finding. Based on a survey undertaken by International Institute for Sustainable Development (IISD), Price, Black Economic Empowerment and Quality were the top three factors identified as key to decision making in the purchasing process (Turley and Perera, 2014)

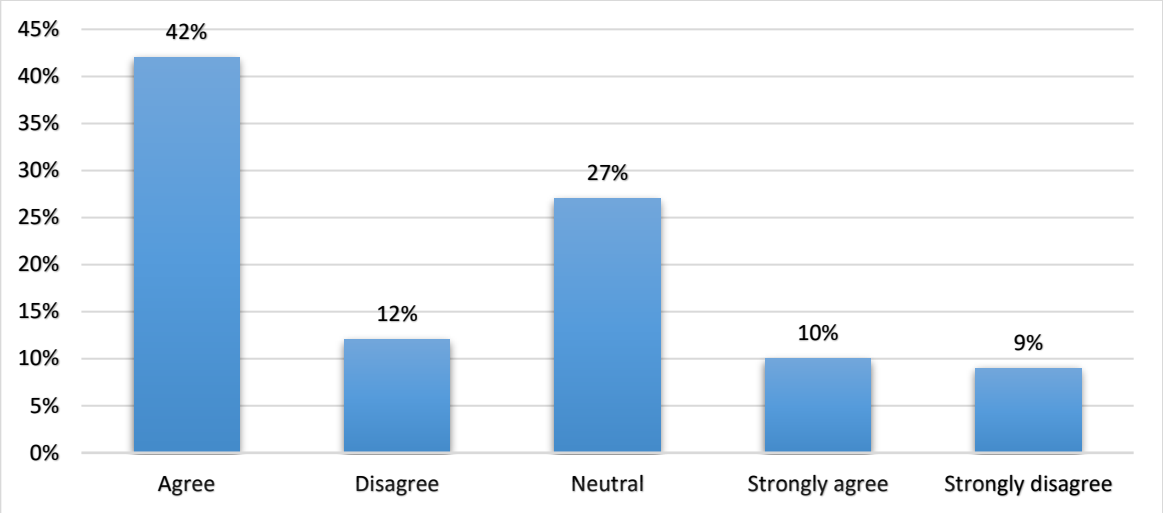


Figure 4.8: Responses on costs of green products and services

4.3.2.3. Life Cycle Costing

Participants were requested to give their thoughts on whether the cost of sustainable purchasing products has a greater benefit in the long run and the majority (77 percent) indicated that there are benefits in the long run compared to 6 percent who disagreed as shown in Figure 4.9. This suggests that although the participants feel that the products are costly they are willing to practice sustainable purchasing.

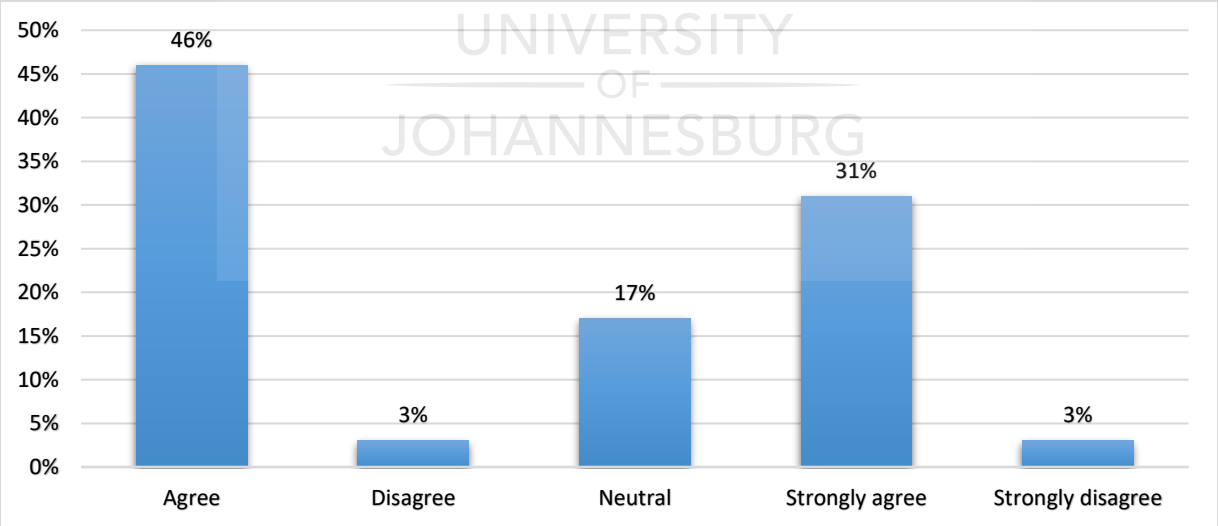


Figure 4.9: Responses on life cycle costing

The general findings in this section suggest that the Cost of Green Products influences the adoption of sustainable purchasing. The finding is consistent with Arisa and Muturi's (2016) paper where they found that the social implication of the production process, cost of green products and limited

design and technology, influenced the implementation of GPP to a great extent. An investigation into GPP practices by (Kipkorir and Wanyoike, 2015) revealed that cost implications, purchase of bio-gradable goods and buying of Eco label products greatly affects the adoption of GPP.

4.3.3 Training and Awareness

4.3.3.1 Lack of Training and Awareness

The participants were asked questions relating to training and awareness in the workplace. Figure 4.10 shows that at least 88 percent confirmed that lack of knowledge greatly affects the implementation of GPP. Friend (2009) points out that information regarding GPP positively influences buyer intention and actual purchasing of green products. Poor knowledge of sustainable purchasing by purchasing staff shows that there are gaps in the implementation of GPP. Kipkorir and Wanyoike (2015) reported that in many cases where strategies have been introduced or are said to be underway by environmental experts in an organisation, the financial expert would be unaware of the said strategies or initiatives.

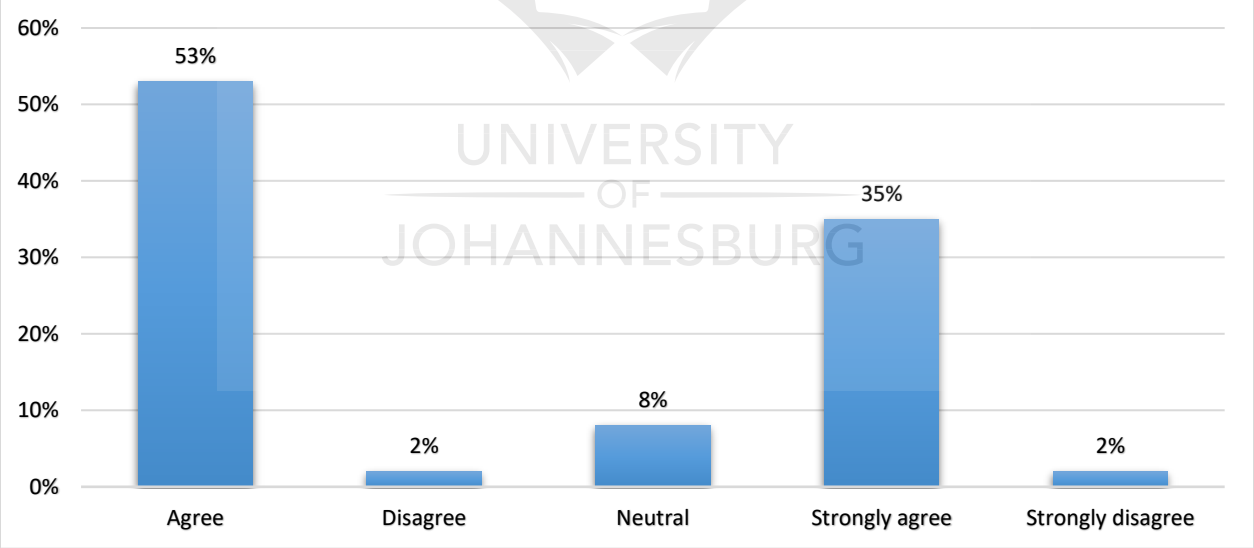


Figure 4.10: Responses on lack of training and awareness

4.3.3.2 Provision of Environmental Awareness and Training

The research wanted to also ascertain the extent to which staff and personnel training on sustainability was provided and 74 percent of the participants indicated that the relevant training was not conducted as compared to only 6 percent who indicated that they had received some form

of training (Figure 4.11). Nelson Mandela Bay Municipality reported in their Sustainable Purchasing Strategy document (2011) that education was offered to the heads of corporate and shared services of the province and municipality to allow them to study and fully understand the implications of the new criteria for purchasing decisions. The director of SCM then facilitated training for all relevant staff in the province/municipality dealing with purchasing. There was good support to effectively implement the policy.

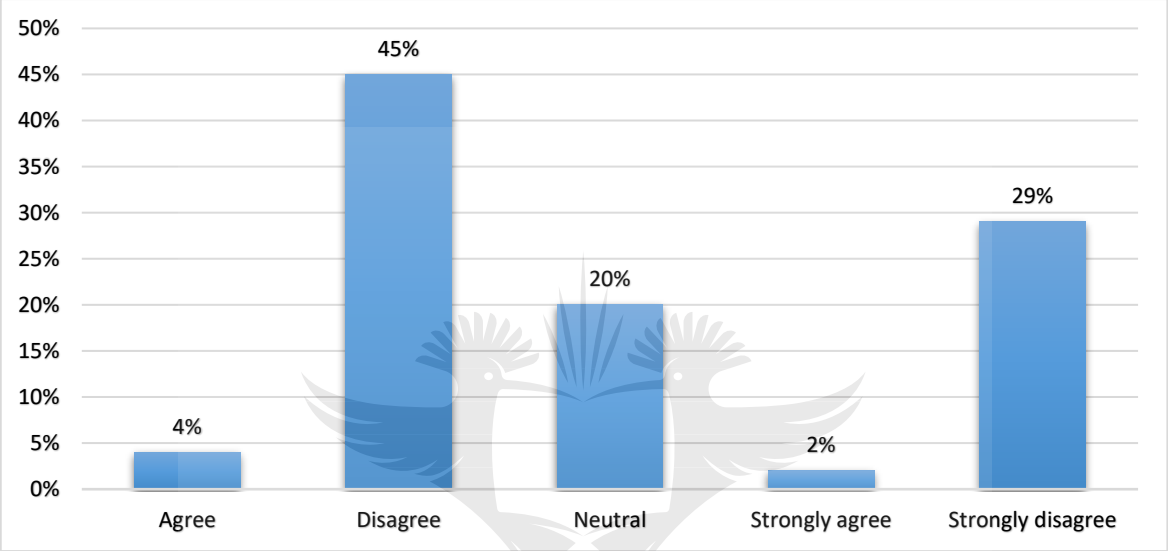


Figure 4.11: Responses on environmental awareness and training

4.3.3.3. Accessibility to Environmental information in the workplace

Participants were asked to share their views on the availability of environmental sustainability information. Figure 4.12 shows that 50 percent disagreed that relevant information is readily available as compared to 22 percent who indicated that the information is available. According to Tshangela (2014), "lack of knowledge on environmental benefits of purchasing products limits the application of sustainable purchasing preferences in an organisation".

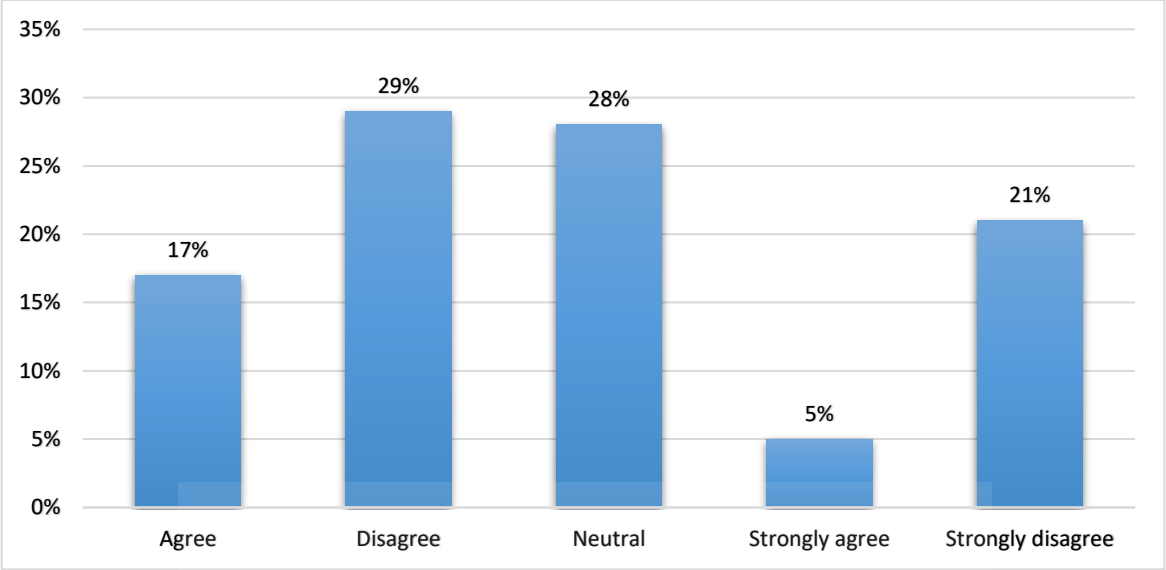


Figure 4.12: Responses on accessibility to environmental information in the workplace

4.3.4 Bid Specification

4.3.4.1 Inclusion of environmental criteria in bid proposals

When participants were asked to give their observations on whether the CoJ considers the environmental criteria when purchasing goods, the results show that about 46 percent do not think that criteria are taken into consideration as compared to 11 percent who indicated they agreed. These results are presented in Figure 4.13.

In the above analysis, 55 percent indicated that preferential purchasing policy is the most considered criteria when procuring goods followed by black economic empowerment (23 percent) and price (18 percent). Ninlawan *et al*. (2010) used a logistic model and the Orbit model that revealed that cognisance of sustainable purchasing strategies and ideas is highly important in defining both the choice of adoption and the number of bids that are adopted with the inclusion of environmental criteria.

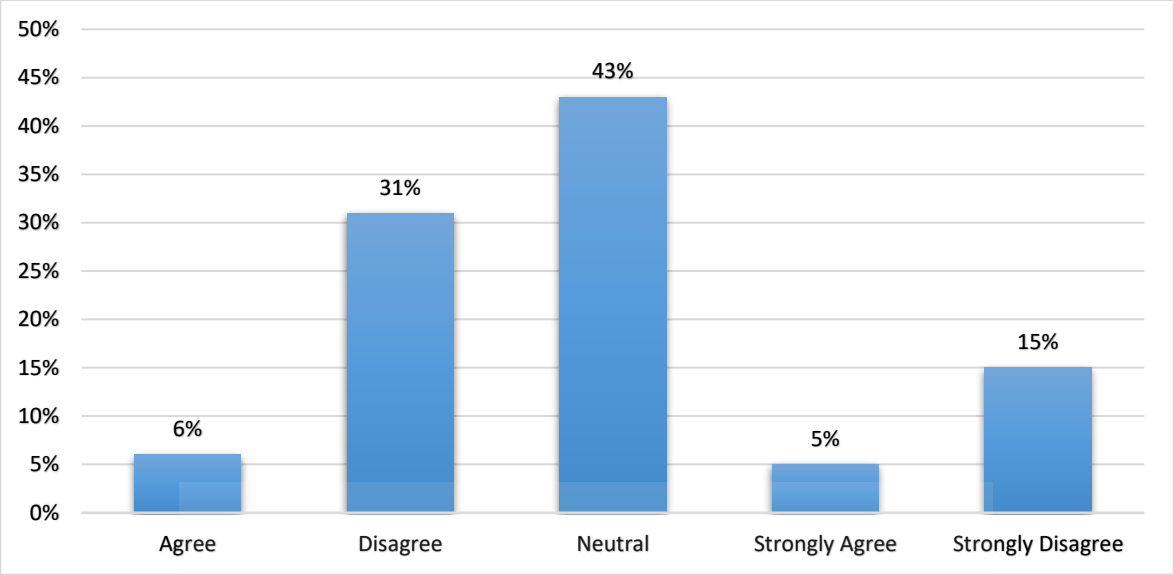


Figure 4.13 : Responses on inclusion of environmental criteria in bid proposals

4.3.4.2 Using Performance as Tool for Bid Specifications

Participants were asked whether the council used performance-based specifications when awarding bids. Figure 4.14 shows the results obtained. 37 percent indicated that the council used them as compared to only 16 percent who disagreed. A performance-based contract is one where the service provider is compensated based on the result of certain contractually outlined performance centered indicators. A relevant example of a performance-based contract is when Emfuleni Municipality awarded a bid to a supplier for installing a large pressure management chamber in Sebokeng in 2005 entirely at the service provider's cost. As a result, R150 million in bulk water costs were saved over a five-year period. The municipality incurred costs of R15 million and the service provider was paid R25 million. The supplier therefore made R10 million (over five years) in return for raising and risking R15 million in return for its technical expertise. As a result, Emfuleni Municipality saved R125 million (GIZ and the strategic water partners network, n.d.).

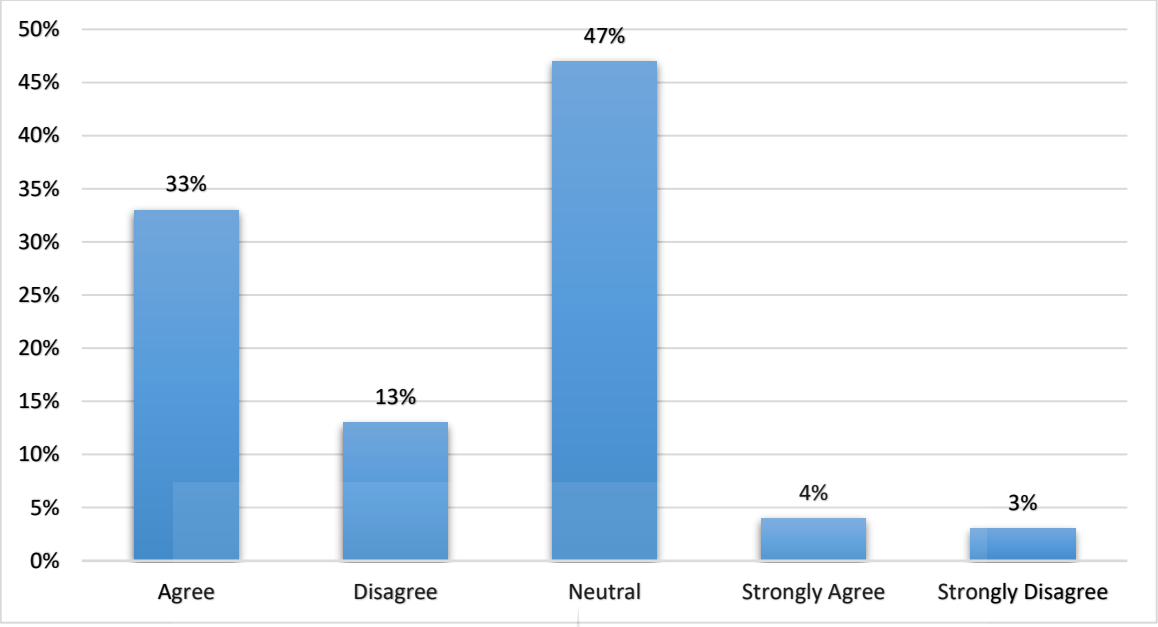


Figure 4.14: Responses on using performance as tool for bid specifications

4.3.4.3 Endeavour to Purchase Green Products and Services

Friend (2009) states that most purchasing staff have a difficulty in defining the term "environmentally friendly" and this makes it difficult for them to integrate environmental elements and attributes when making purchasing decisions. According to Figure 4.15, the greater part of participants (46 percent) disagreed that the CoJ purchases green goods as compared to 16 percent who agreed.

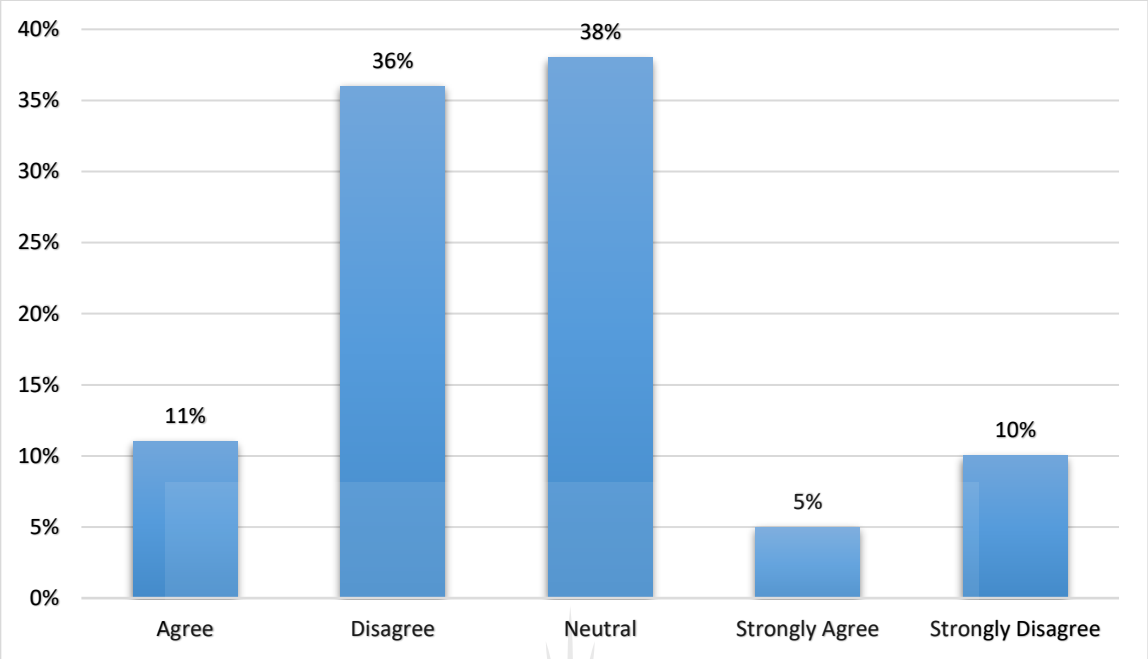


Figure 4.15: Responses on the endeavour to purchase green products and services

4.3.4.4 Stakeholder Relations with Service Providers

The participants were asked to confirm whether the CoJ partners with suppliers who practice sustainability. The results in Figure 4.16 show that 38 percent indicated that the CoJ does not partner with partners who practice sustainability compared to 18 percent who indicated that they do purchase from green suppliers

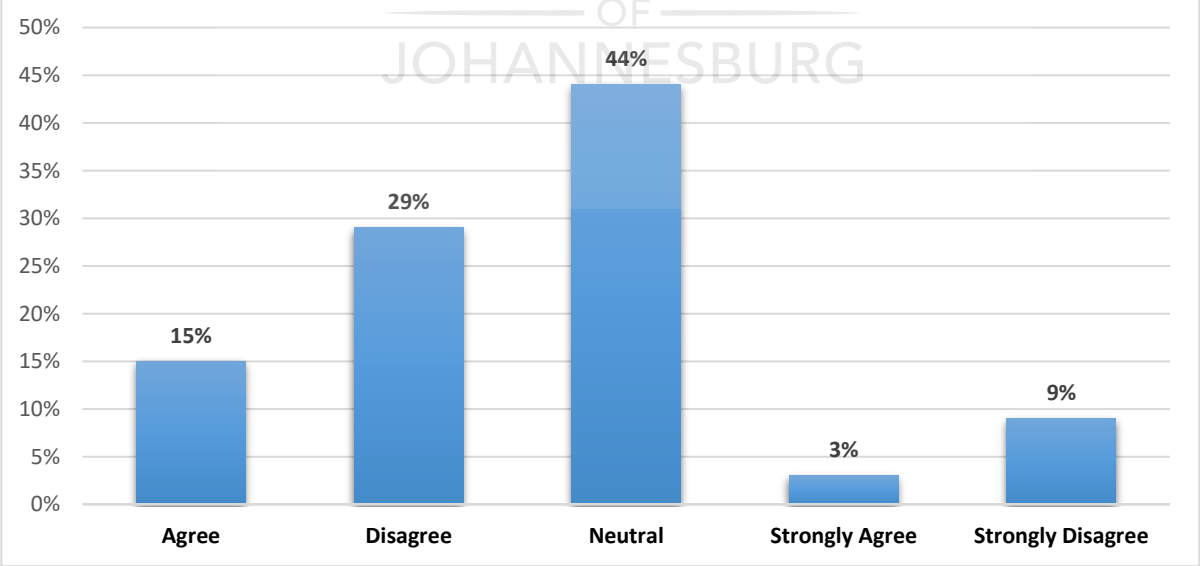


Figure 4.16 : Responses on stakeholder relations with service providers

4.4 Cronbach's Alpha

A Cronbach`s Alpha was used to determine internal constancy of each scale. It was also applied for convergence and discrimination of validity of the constructs. A Cronbach's Alpha coefficient near 1.0 implies that the questions measure comparative components of a factor. By this standard, any factor with a Cronbach's Alpha coefficient under 0.7 ought to be rejected. In this case, all the factors have an alpha greater than 0.7 were acceptable. The composite reliability of 0.784 was assessed to evaluate the internal consistency of the measurement model. Table 4.1 outlines the reliability of the measurement instrument. It further demonstrates that all measures had solid and satisfactory reliability and discriminate legitimacy.

Table 4.1: Cronbach's Alpha

	Scale Mean if Item Deleted	Scale Variance if Item Deleted	Corrected Item-Total Correlation	Squared Multiple Correlation	Cronbach's Alpha if Item Deleted
M1	59.22	64.396	.598	.866	.759
M2	59.25	64.351	.654	.798	.756
M3	59.35	68.189	.374	.499	.774
M4	59.24	65.437	.529	.795	.763
C1	58.89	72.463	.071	.369	.795
C2	58.22	70.739	.214	.307	.783
C3	58.64	71.041	.196	.243	.785
TA1	58.04	74.544	-.015	.265	.794
TA2	60.17	67.052	.493	.548	.767
TA3	59.65	64.432	.501	.552	.764
TA4	60.16	66.580	.455	.575	.768
TA5	58.81	69.974	.184	.223	.788
B1	59.66	65.661	.522	.556	.764
B2	58.99	70.374	.280	.249	.779
B3	59.56	66.552	.469	.613	.768
B4	59.47	66.595	.498	.655	.766
G1	58.78	69.466	.299	.390	.778
G2	58.44	72.714	.067	.468	.794
G3	58.76	69.114	.312	.555	.778
G4	58.69	69.368	.314	.532	.777

A Cronbach's Alpha was conducted on four management practices touch points, three cost touch points, five training and awareness touch points, four bid specification touch points and four green implementation touch points. The closer the coefficient is to 1, the more reliable the data and a cut off of 0.7 was used to determine whether the variable was reliable or not. The measured coefficient values are high with highest coefficients measuring on the touch point related to training and awareness greatly affects the implementation of GPP at a value of 0.794 whilst the lowest measured touch point was management adhere to the environment and sustainable purchasing policies at a value of 0.756.

4.5 Correlation Analysis

The Spearman rank-order correlation coefficient (Spearman's connection, for short) is a nonparametric proportion of the quality and direction of association that exists between two variables estimated on a scale. Table 4.2 shows the Pearson correlations between management practices, cost of green goods, training and awareness, bid specification and green implementation.

Table 4.2: Correlation matrix

		Cost	Training and Awareness	BID Specification	Green Implementation	Management
Cost	Pearson Correlation	1	.128	.133	.379**	.017
	Sig. (2tailed)		.205	.188	.000	.870
	N	100	100	100	100	100
Training and Awareness	Pearson Correlation	.128	1	.415**	.209*	.459**
	Sig. (2tailed)	.205		.000	.037	.000
	N	100	100	100	100	100
BID Specification	Pearson Correlation	.133	.415**	1	.039	.542**
	Sig. (2tailed)	.188	.000		.696	.000
	N	100	100	100	100	100
Green Implementation	Pearson Correlation	.379**	.209*	.039	1	-.091
	Sig. (2tailed)	.000	.037	.696		.368
	N	100	100	100	100	100
Management	Pearson Correlation	.017	.459**	.542**	-.091	1
	Sig. (2tailed)	.870	.000	.000	.368	
	N	100	100	100	100	100

Spearman's correlation was performed between the determinants and green implementation. The cost of green products and training and awareness has a positive correlation of 0.379 and 0.209 indicating that the participants of the CoJ municipality felt that the cost of green products and training and awareness does positively affect the implementation of GPP. From the responses given by the participants on questions related to Training and Awareness, the majority of the responses suggest that the CoJ has to do better through providing awareness campaigns on sustainability strategies and training sessions. The correlations between management practices and bid specification are 0.542 indicating that management makes the final decision when the council is procuring goods from suppliers.

4.6 Tests of Hypotheses

The two-sample t-test is used to determine if the two population means are equal. The impetus behind the test is to determine if there is statistical proof that the mean contrast between paired observations on a specific outcome is essentially not quite the same as zero. This test was appropriate for the hypotheses since the study wanted to test that the means of management practices, cost of green products, training and awareness, bid specification and green implementation are not significantly different. This method computes the two-example t-test, the Mann-Whitney U test and the Kolmogorov-Smirnov trial of information either contained in two variables (columns) or in one variable listed by a second (grouping) variable. Table 4.3 shows the Analysis of variance (ANOVA) findings.

Table 4.3: ANOVA table

		Paired Differences 95 percent Confidence Interval					t	df	Sig. (2tailed)
		Mean	Std. Deviation	Std. Error Mean	of the Difference				
					Lower	Upper			
Pair 1	Management - Green Implementation	-.598	1.170	.117	-.830	-.365	-5.105	99	.000
Pair 2	Cost - Green Implementation	.084	.750	.075	-.065	.233	1.123	99	.264
Pair 3	Training and Awareness - Green Implementation	-.699	.827	.083	-.863	-.534	-8.446	99	.000
Pair 4	BID Specification - Green Implementation	-.753	.981	.098	-.947	-.558	-7.674	99	.000

The following Hypothesis were tested:

H1: Management Practices positively influence the implementation of GPP in the CoJ municipality.

Management Practices

The t-statistic is -5.105 and the corresponding two-tailed p-value is 0.000, which is less than 0.05, thus this study rejected null hypothesis at 5 percent level and it was concluded that there is statistical evidence that the influence of management practices on the implementation of GPP in

the CoJ is significantly different. The majority of the participants (51 percent) indicated that management practices can greatly affect the implementation of GPP as shown in Figure 4.17**.**

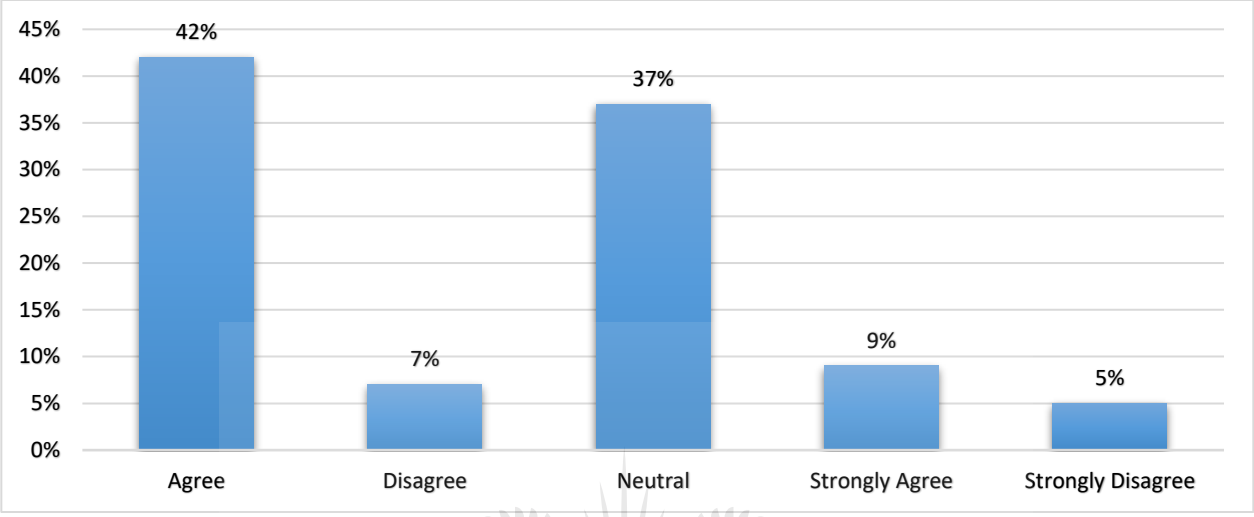


Figure 4.17: Responses on management practices

H2: The Cost of Green Products positively influences the implementation of GPP and practices in the CoJ municipality.

Cost of Green Products

The t-statistic is 1.123 and the corresponding two-tailed p-value is 0.264 which is greater than 0.05, thus this study failed to reject the null hypothesis at 5 percent level and concluded that there is statistical evidence that the influence of the cost of green products on the implementation of GPP in the CoJ is not significantly different. According to Figure 4.18, most of the participants (53 percent) indicated that cost of green products greatly affects the implementation of GPP. Friend (2009) maintains that current research showed that higher prices prevail over ethical considerations and widened the attitude behavior gap in case of buying green goods and services. However, Smith (2010) argues that low price sensitivity of consumers positively affects green purchase performance.

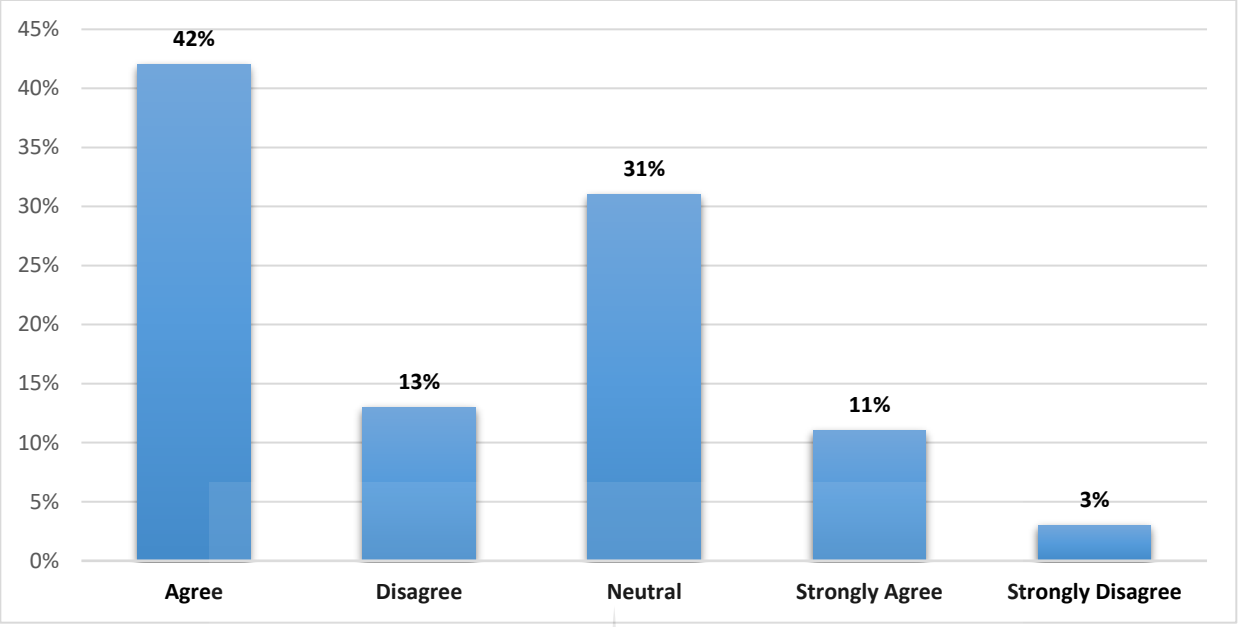


Figure 4.18: Responses on cost of green products

H3: Training and awareness positively influence the implementation and practice of sustainable purchasing in the CoJ municipality.

Training and Awareness

The t-statistic is -8.674 and the corresponding two-tailed p-value is 0.000, which is less than 0.05. Therefore, the null hypothesis is rejected at 5 percent level and the conclusion is that there is statistical evidence that the influence of training and awareness on the implementation of GPP in the CoJ is significantly different (Figure 4.19). Findings presented in Figure 4.19 show that most of the participants (72 percent) indicated that training and awareness positively influences the implementation of GPP in the CoJ.

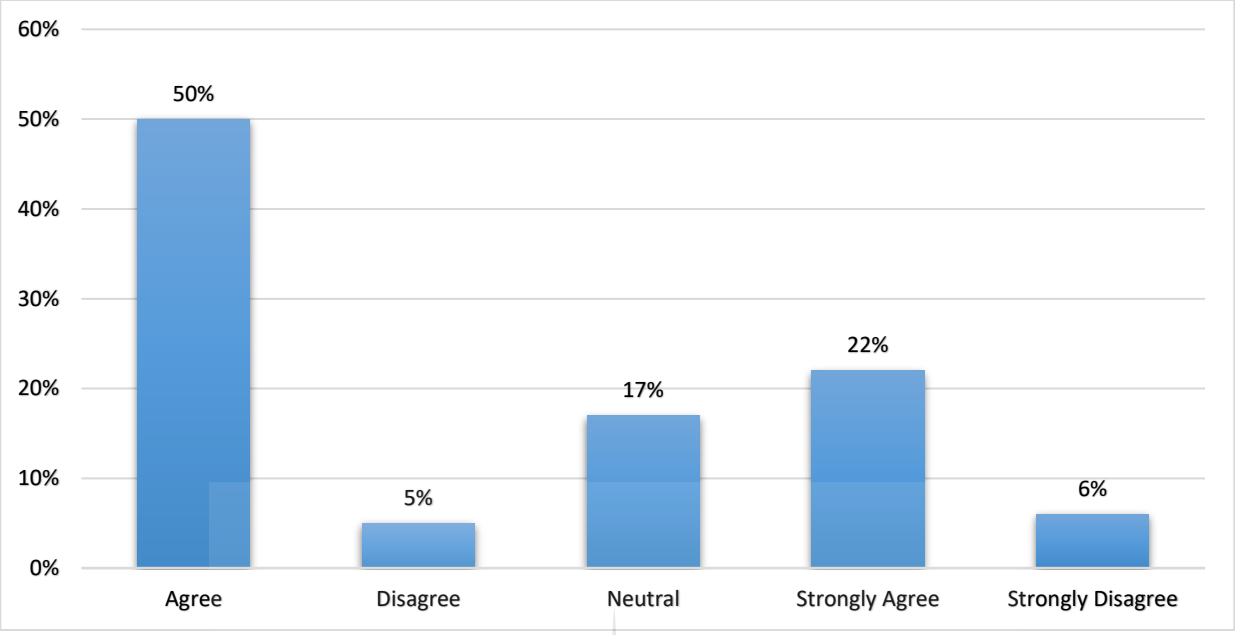


Figure 4.19: Responses on training and awareness

H4: Bid specification positively influences the implementation and practice of green purchasing in the CoJ municipality.

Bid Specification

The t-statistic is -7.674 and the corresponding two-tailed p-value is 0.000 which is less than 0.05. The null hypothesis is therefore rejected at 5 percent level and it can be concluded that there is statistical evidence that the influence of bid specification on the implementation of GPP in the CoJ is significantly different. According to Figure 4.20, a greater percentage of the participants (54 percent) indicated that Bid Specification greatly affects the implementation of GPP as shown in Figure 4.20. Ji *et al.* (2014) reported that literature shows that limited accessibility of green products had a negative influence on consumer's intent and behaviour to purchase.

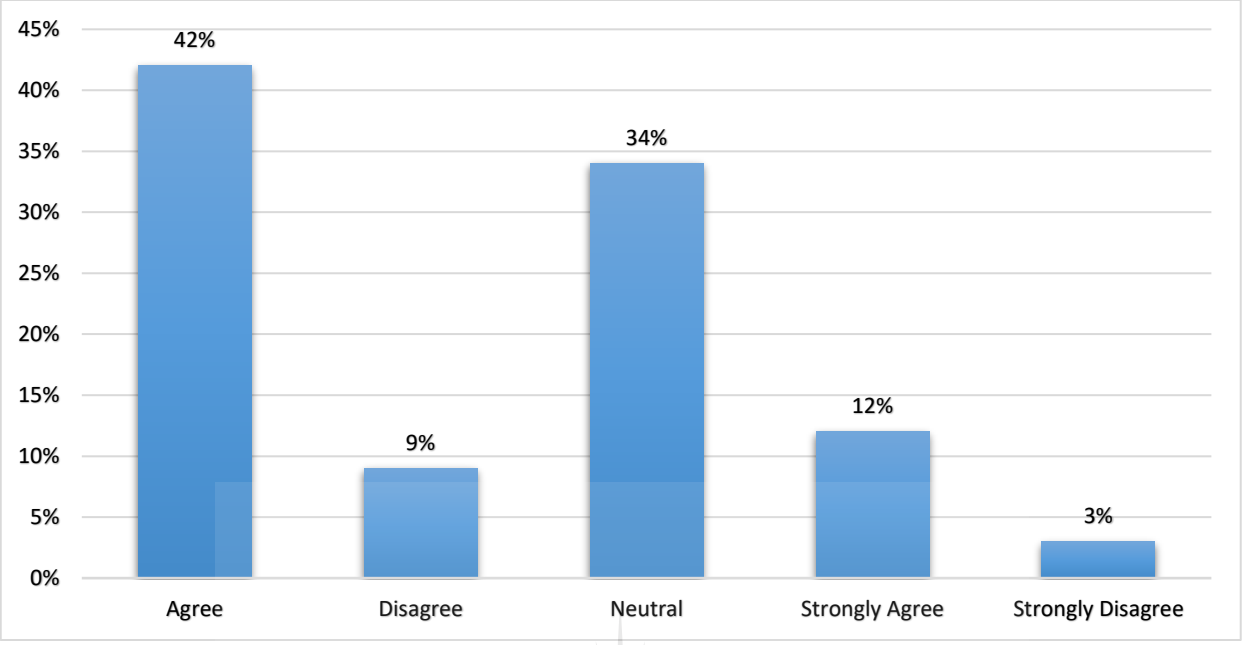


Figure 4.20: Responses on bid Specification

4.7 Principal Component Analysis

The Kaiser-Meyer-Olkin Measure of Sampling Adequacy indicates the proportion of variance in the variables that might be caused by underlying factors. High values (close to 1.0) generally indicate that a factor analysis may be useful with the data. The Kaiser-Meyer measure for this dataset is 0.788 as shown in Table 4.4 indicating that sample size is adequate to perform factor analysis.

Bartlett's test of sphericity tests the hypothesis that correlation matrix is an identity matrix which would demonstrate that variables are irrelevant and therefore inappropriate for structure recognition. Small values (less than 0.05) of the significance level show that a factor analysis might be valuable with information and for this situation the test was critical at 5 percent level (Table 4.4).

Table 4.4: Kaiser-Meyer-Olkin measure of sampling adequacy

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.788
Bartlett's Test of Sphericity	Approx. Chi-Square	682.380
	Df	120
	Sig.	.000

The principal Component Exploratory Factor Analysis was run in IMB SPSS on the 16 questions. The main eigenvectors from the eigenvalues deterioration of the correlation or covariance matrix of the variables depicts a progression of uncorrelated linear combinations of the variables that contain the vast majority of the change. The extracted uncorrelated components are called principal components (PC) which are estimated using the eigenvectors of the covariance or correlation matrix of the original variables. In addition to data reduction, the eigenvectors from a PCA are regularly assessed to get familiar with the fundamental structure of the information. The components with the highest measure of variance extracted on the basis of having the highest eigenvalues were identified as components one to four. These components explained 61.1 percent of the variance of the total variability in the data as shown in Table 4.5.

Table 4.5: Principal component eigenvalues

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	5.179	32.372	32.372	5.179	32.372	32.372	3.756	23.477	23.477
2	1.757	10.980	43.352	1.757	10.980	43.352	2.939	18.368	41.845
3	1.593	9.955	53.307	1.593	9.955	53.307	1.544	9.649	51.493
4	1.249	7.809	61.116	1.249	7.809	61.116	1.540	9.623	61.116
5	1.080	6.751	67.866						
6	.844	5.276	73.143						
7	.818	5.114	78.256						
8	.651	4.067	82.324						
9	.617	3.854	86.178						
10	.548	3.424	89.602						
11	.451	2.821	92.423						
12	.366	2.284	94.707						
13	.316	1.973	96.681						
14	.245	1.531	98.212						
15	.202	1.265	99.477						
16	.084	.523	100.000						

Extraction Method: Principal Component Analysis.

A Scree Plot is a simple line segment plot that demonstrate the fraction of total variance in the information as clarified or represented by each principal component. The principal components are ordered and by definition are therefore assigned a number label by decreasing order of contribution to total variance. From the fourth factor on, it can be seen that the line is almost flat, meaning that each successive factor is accounting for smaller and smaller amounts of the total variance.

With the scree test, the eigenvalues related with each component are plotted and searched for a "break" between the components with moderately substantial eigenvalues and those with little eigenvalues. The elements that appear *before* the break are thought to be significant and are retained for rotation and in this investigation three components are held (eigenvalue more prominent or

equivalent to one). Those appearing *after* the break are thought to be immaterial and are not held. The Scree plot is shown in Figure 4.21

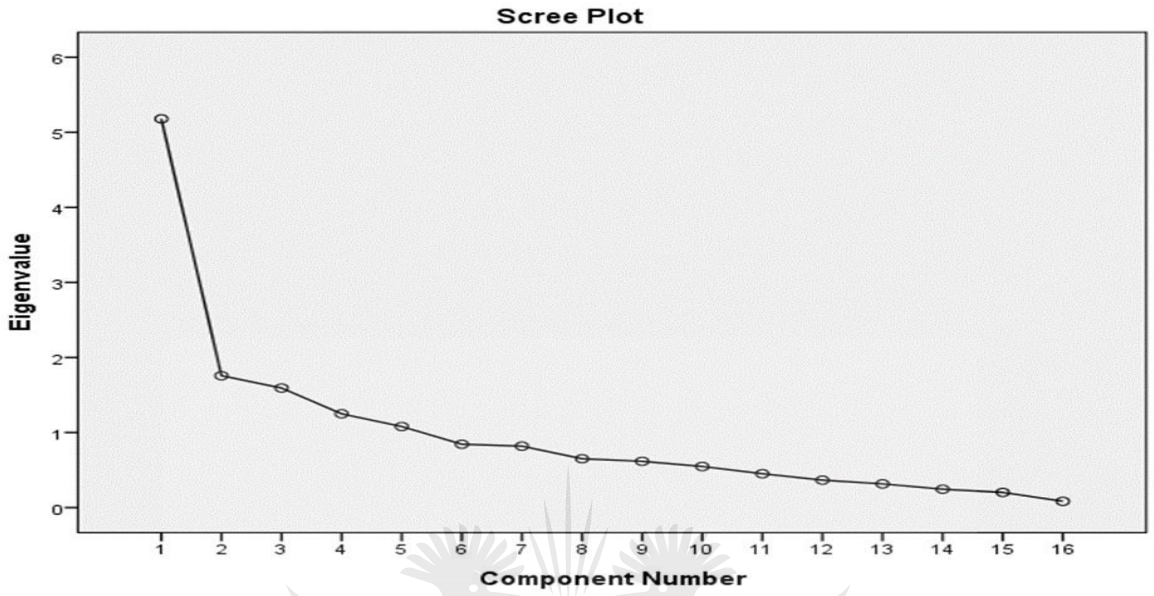


Figure 4.21: Scree plot

By examining factor loadings (rotated components) with an absolute value greater than 0.4; component 1 is characterised by management practices; component 2 is defined by training and awareness whilst component 3 is defined by the Cost of Green Products and Bid Specification.

Table 4.6: Rotated Component Matrix

	Component					Component			
	1	**2**	**3**	**4**		**1**	**2**	**3**	**4**
M1	.918				C1				.729
M2	.850				C2			.613	.480
M3	.738				C3			.678	
M4	.859				TA1		-.570		
B1		.502			TA2		.781		
B2			.693		TA3		.722		
B3		.620			TA4		.672		
B4	.525	.472			TA5				.660
Extraction Method: Principal Component Analysis									

The factor analysis findings in Table 4.6 indicate that the variables that contribute to the implementation of GPP are management practices, cost of green products, training and awareness and bid specification.

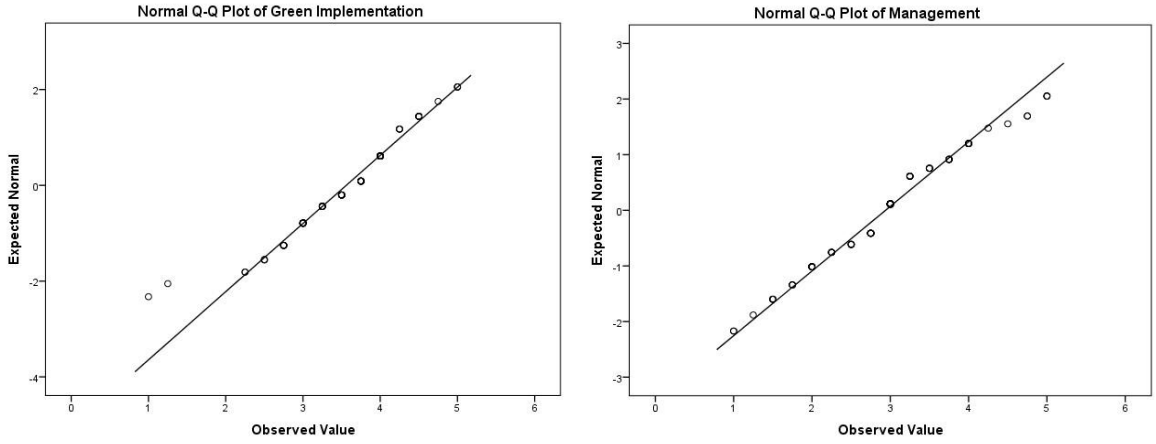
4.8 Outlier Detection

According to Rousseeuw and Leroy (2005), "the standard method for multivariate outlier detection is robust estimation of the parameters in the Mahalanobis distance and the comparison with a critical value of the chi-square distribution". The Mahalanobis distance (MD) is the distance between two points in multivariate space.

The Mahalanobis distance of Perceived Ease of Use (PEU), Perceived Usefulness (PU), Attitude towards Using (ATT) and VISIBILITY was calculated using IBM SPSS and compared to a chi-squared distribution with the same number of degrees of freedom (number of independent variables). The probabilities of the cumulative distribution were then compared against 0.001. Any probabilities below 0.001 are an outlier. Only one observation had a probability below 0.001 and was removed from the analysis.

4.9 Tests for Normality

Normality can be determined graphically using the output of normal Q-Q Plots. If the information is normally dispensed, the information points will be close to the diagonal line. The data is not normally distributed if the information points stray from the line in an obvious non-linear fashion. Figure 4.22 shows the normal Q-Q plots which indicated that the information is normally dispensed.



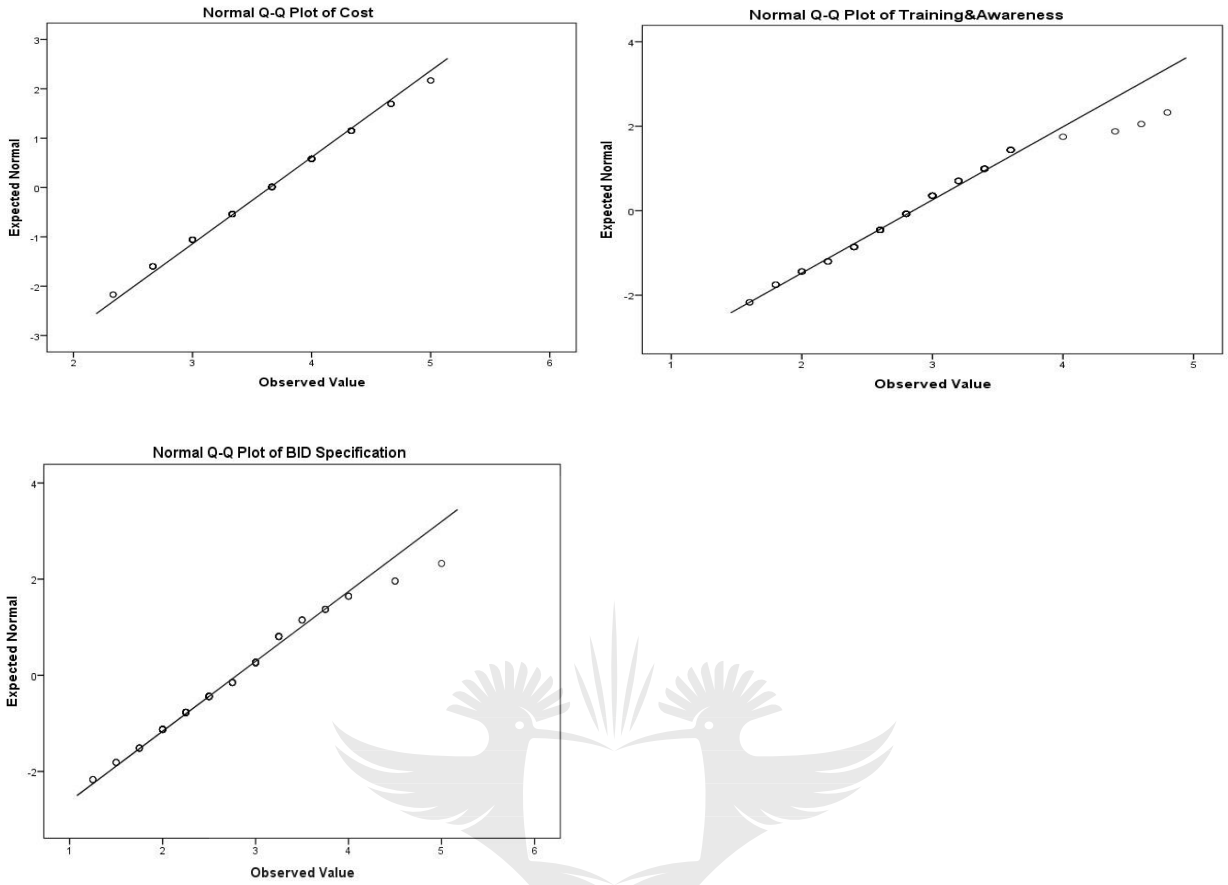


Figure 4.22: Q-Q plots

4.10 Regression Analysis

A regression technique was applied to determine the importance of the predictor variables. A predictor that has a low p value of less than 0.05 is probably going to be a significant expansion to the model because changes in the predictor's value are correlated to changes in the reaction variable.

The output of the regression analysis indicates that the Cost of Green Products is highly significant with a $p<0.000$ and the coefficient is positive as shown in Table 4.7. Training and awareness ($b=0.328$, $p<0.015$) and management practices ($b=1.658$, $p=0.050$) are also significant. These findings are in harmony with previous work conducted by (Testa *et al*., 2016) who revealed that knowledge of sustainable purchasing was driven by information and training initiatives. Brammer and Walker (2011) underline the significance that organisations and especially purchasing personnel have correct competences, expertise and tools to implement sustainable purchasing practices.

Table 4.7: Regression analysis

Model		Unstandardized Coefficients		Standardised Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.658	.499		3.321	.001
	Management	-.185	.097	-.219	-1.910	.050
	Training and Awareness	.328	.132	.264	2.484	.015
	Cost	.410	.110	.348	3.747	.000
	BID Specification	.003	.117	.003	.023	.982

The factor bid specification (b = 0.03, p = 0.982) was not significant at 5 percent level of significance. This is perhaps due to lack of knowledge and information amongst the employees on sustainable purchasing products leading them not to specify green requirements when advertising for bids. The participants also indicated that both Price and Black Empowerment are the key factors considered when procuring goods rather than green compliance. Friend (2009) listed several challenges of implementing sustainable purchasing such as top management support, limited knowledge and cost-effectiveness of sustainable purchasing.

4.11 Summary of Analysis

The study found that the greater part of the participants indicated that management practices (51 percent) and cost of green products (55 percent) can greatly affect the implementation of GPP. The greater majority of the participants (72 percent) indicated training and awareness was the most important factor of sustainable purchasing implementation whilst 54 percent indicated that Bid Specification also plays an important role.

The results of the regression analysis indicated that the cost of green products, management practices, and training and awareness are significant factors of green implementation in the CoJ at 5 percent level of significance (Table 4.7).This means that training and awareness campaigns on implementation of GPP programme and tools is highly critical.

4.12 Conclusion

The research aimed to determine the factors that affect the implementation of GPP practices in the local government in the CoJ. The research tool was sent to various purchasing personnel to share their views on sustainable purchasing. The majority of the participants (51 percent) indicated that Management Practices can greatly affect the implementation of GPP. Participants were asked whether the Cost of Green Products determine the implementation of GPP and 55 percent confirmed. The greater majority of the participants (72 percent) indicated that Training and Awareness was the most important factor of sustainable purchasing implementation whilst 54 percent indicated that Bid Specification also plays an important role.

When asked whether the participants knew about the existence of the environmental policy and sustainable purchasing policy, 60 percent of the participants had knowledge of the environmental policy while only 23 percent knew about the sustainable purchasing policy. However, there was a possibility that the 23 percent were possibly referring to the environmental policy since to the best of the researcher's understanding the CoJ does not have an existing sustainable purchasing policy. In most instances policies such as SCM policy, waste management policy, energy and climate change and environmental policy are often confused with sustainable purchasing.

The outcomes of the regression analysis indicated that the Cost of Green Products, Management Practices and Training and Awareness are significant factors of green implementation in the CoJ at 5 percent level of significance.

5. DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This chapter concludes by discussing the factors related to the implementation of GPP and presents implications of the findings, conclusions, recommendations, limitations of the study and future research.

5.2 Aims and Objectives of the Study Recap

The key motivation behind the study was to determine the factors that influence the implementation of GPP practices in the CoJ. In other words, the research was focused on determining what drives the CoJ to procure and implement basic green products for sustainable development, climate change challenges and resource constraints.

The objectives of the research study were:

i. To measure if management practices determine the extent to which the CoJ municipality practices sustainable purchasing.
ii. To assess how the cost of green products and services determines the implementation of GPP practices by the CoJ municipality.
iii. To evaluate if training and awareness determines the extent to which the CoJ municipality practices sustainable purchasing.
iv. To assess how bid specification determine the effective implementation of GPP by the CoJ municipality.

5.3 Discussion

5.3.1 Management Practices

Participants were requested to share their thoughts on whether management practices promote and support sustainable purchasing initiatives. 55 percent were neutral whilst 22 percent were in agreement and 23 percent of the participants disagreed. These findings are in harmony with those of researchers such as Friend (2009) who is of the view that a lack of top management support was among the most important obstacles in GPP implementation. How top management responds and supports new concepts such as GPP greatly affects its implementation and success. Good management practices support the implementation of new ideas from conceptualisation to

realisation and create an enabling environment to support new organisational processes and models (Testa *et al*., 2016).

Smith (2010) explained that some of the management practices that are barriers to new ideas include:

i. not listening to employees - this behaviour discourages staff from participating in new projects;
ii. claiming ownership of an idea - employees feel betrayed by management that takes credit for their initiatives because it diminishes their sense of responsibility;
iii. extremely testing and interrogating ideas - management needs to be more careful not to make employees feel that their ideas are not strategic or good enough thus shooting down their confidence.

The research findings are that management practices positively influence the implementation of GPP. For GPP to succeed, it needs to get support and commitment from the top management. The view of the researcher is that it is important to include staff from all levels in the institution in the strategic management development from the initiation which would assist to secure a buy-in when the idea is still a concept and it would assist with the implementation.

5.3.2 Cost of Green Products

The study revealed that majority of participants (52 percent) indicated that green products are costly. This supports the perception that green items are expensive, mostly because the upfront purchasing costs are likely to be higher. This observation is frequently misconstrued in light of the fact that the overall expense of green items (the life-cycle costs) really have a tendency to be less as there is compensation in the operation, maintenance and disposal costs. In most instances, it is a difficult task to change the behaviour of purchasing personnel to concentrate more on the lifecycle costs and not the buying costs (European Commission, 2009). Consequently, organisations end up with short term visions and in the end they do not see the long term benefits of investing in the implementation of GPP. This challenge is exacerbated when organisations only have restricted budgets more especially in government where they have to prioritise expenditure according to urgency rather than importance (Turley and Perera, 2014).

Arisa and Muturi (2016) investigated the constraints that influence the implementation of GPP in Kenya using the descriptive research design approach. The initial cost of green products was one of the variables used in the study. The study established that the costs of green products influenced the implementation of GPP to a great extent, hence it could conceivably be hypothesised that the cost of green products positively influences the implementation of GPP and practices as is the case of the CoJ municipality.

5.3.3. Training and Awareness

The European Commission (2009) identifies a lack of training as the greatest challenge in GPP. This statement concurs with the findings of the study which indicate that 88 percent of participants confirmed that lack of knowledge greatly affects the implementation of GPP. Purchasing officers were asked if training and education had been conducted, and 74 percent of the participants indicated that the relevant training had not been conducted as compared to only 6 percent who indicated that they had received some form of training. According to Ji *et al*. (2014), "training and education are critical requirements to achieve successful implementation of GPP practices in any organisation". Shen *et al*. (2017) examined the knowledge of real estate developers in China for adopting GPP and the study revealed that estate agencies in Chongqing China were not knowledgeable of sustainable purchasing.

Purchasing personnel must be trained on concepts such as life-cycle costs together with legal and technical aspects of GPP. It is also equally important to train the end-user on how to use products in a sustainable manner. The implementation of GPP involves technology that is advanced and specialised knowledge is required (Tshangela, 2014). The results of this study provide further support for the hypothesis that training and awareness positively influence the implementation and practice of sustainable purchasing. On the face of it, this would suggest that training and awareness is an important factor in advancing implementation of GPP in the CoJ municipality.

5.3.4 Bid Specifications

Bid Specification and assessment of a bid is a major part of the purchasing process. It was therefore important to examine how bid specification determines the effective implementation of GPP in the CoJ municipality. Bid specification serves as an opportunity to examine how the service provider is going to deliver the services and product needs from a budget, quality and sustainability

perspective (OECD, 2011). The results in Chapter 4 revealed that 46 percent of respondents did not think that criteria was taken into consideration when the CoJ compiled bid specifications as compared to 11 percent who indicated otherwise. Ninlawan *et al*. (2010) examined factors that facilitate the successful implementation of GPP in the manufacturing industry of Zimbabwe. The study concluded that the inclusion of environmental criteria in bid specifications contributes to the successful implementation of GPP.

According to the findings in this study, it can be inferred that bid specification positively influences the implementation and practice of sustainable purchasing in the CoJ municipality. If the compilation of a bid includes sustainability criteria, it would assist to fast track the implementation of GPP. Bid specifications must be set in such a way that it must be critical for service providers to have them in order to qualify to bid and are considered as pass/ fail criteria (Porter and van der Linde, 1995). There is a need to introduce sustainability considerations in product specifications in the public sector purchasing policies according to purchasing and supply (ICLEI, 2017).

5.4 Conclusion

The research aimed to determine the factors that affect the implementation of GPP practices in the CoJ and provide the recommendations to the city council. The CoJ is one of the major emitters of greenhouse gasses in South Africa due to industrial, transport and residential activities driven by rapid population growth. According to ICLEI (2017), governments are in a better position to promote sustainable SCM by encouraging the establishment of purchasing policies that would encourage development and diffusion of environmentally friendly products and services.

In the CoJ, GPP is facing an adverse environment for its implementation. There is a lack of internal communication on GPP. Educating procurement staff GPP issues and policies is an important step in policy implementation. However, in the CoJ, no effort has been made to promote the importance of GPP or to inform procurement personnel about the content and the goal of GPP hence training and awareness came out as the strongest factor contributing to non-implementation of GPP. The CoJ procurement personnel had little knowledge about GPP. The use of the lowest bidding selection method and lack of knowledge are affecting the implementation of GPP. The CoJ does not have skilled GPP professionals to initiate the process. Those who are involved in green procurement are management and most of them do not have green procurement experiences and know little about the GPP and this was delaying implementation.

5.5 Implications of Study Findings

The implications of the findings of this study towards the implementation of GPP in the CoJ and other South African municipalities will be discussed under four headings: management practices, training and awareness, bid specifications and cost of green products.

5.5.1 Implications for Management Practices

The findings of the study revealed that management support was an important factor for GPP to succeed. Support from top management is important because it sets the agenda for GPP programmes. A buy in from political principals in the CoJ will be a critical step towards setting the tone of the GPP agenda. Buy-in from politicians is important because the process of creating awareness programs requires budget approval from the council.

5.5.2 Implication for Training and Awareness

Training and awareness came out as the most significant factor contributing to the non-implementation of GPP. Training and awareness are key in the CoJ because the findings of the study indicated that top management and staff do not have knowledge of GPP. The absence of GPP knowledge amongst CoJ management and staff means that it would be impossible for GPP to take off the ground. The fact that the GPP is mentioned in the CoJ SCM policy means that the chances of creating awareness is possible.

5.5.3 Implication for Bid Specifications

This study showcased that the CoJ is having trouble in the preparation of tenders that have got green element and this can be attributed to the lack of training. The findings of this study showed that procurement personnel are unsure of how to integrate environmental issues in their purchasing, although it is mentioned in the SCM policy. Consequently, the CoJ needs to take bid specification seriously and involve suppliers and service providers in its GPP projects.

5.5.4 Implication for the Cost of Green Products

This study revealed that most CoJ staff have the perception that green products and services are costly. This meant that staff is not aware of the concept of life cycle costing which focuses on

future benefits of a product regardless of initial costs involved. This finding implies that the CoJ must consider revising its purchasing budget for various projects.

5.6 Recommendations

Based on the study findings in Chapter 4 and discussions above, it is recommended that the CoJ municipality should consider the following:

- The Municipality needs buy-in and understanding, particularly from politicians (political mandate) especially amidst the current coalition government arrangement. The buy-in could be done by tabling a report on GPP at the Environment, Infrastructure and Services (EIS) and Finance portfolio committee meetings that are attended by councillors.
- The Municipality needs to establish a programme of knowledge-sharing for all employees to promote and raise awareness on sustainable purchasing, its benefits and external drivers, to increase interest. It is important to have detailed training for purchasing staff. The cause of resistance to change may be attributed to the lack of awareness and information. This means that if channels of communication are opened, it may lower the possibilities of resistance to transformation (Boohene and Williams, 2012).
- The Municipality needs to create a formal GPP policy, either as an independent document or as part of the SCM policy that is adopted at an organisational level and a regular review of the policy must be done. This is one of the key approaches to defeat boundaries to GPP, as it will point clear goals and objectives for the whole municipality.
- The Municipality needs to undertake a self-evaluation exercise: one of the critical steps in implementing GPP is conducting an evaluation of your current purchasing behaviors. This exercise will assist the municipality to know exactly what they purchase, quantities, price and if they are procuring environmentally friendly products and services. This would assist to measure future success and to focus on the development of GPP goals.
- The Municipality needs to pilot a project: running a pilot project will help to provide hands-on experience in procuring green products and services, by applying GPP principles to a specific product or service. Such projects can be useful in generating comprehensive guidance on buying patterns.

- The Municipality needs to conduct a benchmarking exercise with other metropolitan municipalities such as NMBM, City of Cape Town municipality and the Western Cape provincial government who are currently in the process of crafting strategies for implementing GPP.

5.7 Limitations of the Study

GPP in South Africa is still in its infancy state and most purchasing personnel in the CoJ municipality are not familiar with it. As a result, some of the targeted respondents did not respond to the research questionnaire because they did not know what green public purchasing was. Collecting data using Google forms was a challenge as other respondents did not know how to respond to Google forms as it is a relatively new way of collecting data and this caused a delay in gathering data required for the sample size. Participation from the municipal entities was limited as they consider themselves to be autonomous from core departments of the municipality. Further studies could include the city`s entities.

5.8 Future Research

In 2013, South Africa has established the Office of the Chief Procurement Officer (OCPO). The main aim of this office is to reform and oversee the South African SCM system in the public sector, to make sure that buying of goods and services is fair, impartial, transparent, competitive and cost effective in line with all relevant legislations. Although the OCPO does not participate directly in procurement, it is responsible for leading and managing procurement reforms in South Africa. The OCPO has collected and analysed information on products that government purchases. The OPCO knows for example, who the top 100 suppliers are. Further studies can therefore be conducted on how OPCO can play a role in driving the implementation of GPP in government procurement, for example the creation of a green database, facilitate training and awareness of GPP, Eco labelling and driving regulations that could drive the inclusion of green criteria in all government bids.

GPP is already a proven concept in Europe. The European Union commission on environment is successfully coordinating GPP in Europe by mandating its member states to establish national action plans on GPP. The commission also closely monitors the implementation. The African Union (AU) does not have a dedicated environment desk that is focused on environment issues but they do host sectorial ministerial conferences such as Conference of Ministers Responsible for the

Environment. Future studies can explore how the AU and its member states can collaborate in coordinating GPP in Africa.

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APPENDIX A – QUESTIONNAIRE

Green Procurement Questionnaire

Study Title: An Assessment on the Implementation of Green public procurement the in City Johannesburg Metropolitan Municipality

This is a request for your voluntary participation in a short survey on GPP implementation in the City of Johannesburg.

The survey consists of only few multiple-choice questions to be completed in less than 5 minutes. Questions seek information and knowledge you may share with us on GPP.

The findings will be used for academic purpose and confidentiality applies.

I can be reached with the below contact. Thank you very much for your responses.

Mr Ernest Mutenda
083 294 7250 / 011-407-7186 | ernestmu@joburg.org.za | ernestmutenda@yahoo.com

Email address *
Please indicate the name of your council. Please tick your gender Tick all that apply.

- Male
- Female

Please tick your Job Position Tick all that apply.

- Group Head
- Executive Director
- Director
- Unit Head
- Deputy Director
- Assistant Director
- Manager
- Operational Manager
- Specialist
- Administrative Officer

- Other

Does your organisation have an environmental policy? Tick all that apply.

- Yes
- NO

- Dont Know Does your organisation have a green procurement policy? Tick all that apply.

  - Yes
  - NO
  - Dont Know

Does your organisation take into consideration the environmental policy when procuring goods or services?
Tick all that apply.

- Yes
- NO
- Dont Know

Does your council take into consideration the green procurement policy when procuring goods or services?
Tick all that apply.

- Yes
- NO
- Dont Know

Identify the key criteria used in the council procurement decisions Tick all that apply.

- Preferential Procurement Policy
- Black Economic Empowerment
- Price
- Value for money

- Environmentally friendly products

Management Practices

Management promote and supports green procurement initiatives within the organisation Tick all that apply.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Management adhere to the environmental and green procurement policies Tick all that apply.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The transition to green procurement/environmental friendly products and services was transparent Tick all that apply.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Management promotes the purchasing of green procurement/environmental friendly products Tick all that apply.

- Strongly Disagree
- Disagree

- Neutral
- Agree
- Strongly Agree

Cost of Green Products

There is a greater perception that green procurement products are costly Mark only one oval.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The cost of green procurement products has greater benefits in the long run Mark only one oval.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The cost of green procurement products is highly determined by the limited availability of the products locally
Mark only one oval.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Training and Awareness

Lack of knowledge about the environment and how to develop green procurement knowledge criteria greatly affects the implementation of green procurement Mark only one oval.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Environmental education and training for all employees have been conducted Mark only one oval.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Information about environmental sustainability,climate change and global warming is readily available at my workplace Mark only one oval.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Workshops and seminars about environmental sustainability, green procurement is provided to all the employees regularly Mark only one oval.

- Strongly Disagree
- Disagree
- Neutral

- Agree
- Strongly Agree

I have adequate knowledge of the following concepts; renewable energy,energy efficiency,climate change,mitigation,green procurement,global warming,sustainable development,carbon,solar water heater Mark only one oval.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Bid Specification

When purchasing goods and services the council includes environmental criteria into its calls for tender
Tick all that apply.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

The council uses performance based specifications most often in the procurement process Tick all that apply.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

We purchase “green” (recyclable, reusable, non-toxic, bio-degradable, and made from 100% post-consumer recycled materials) supplies, products and materials Tick all that apply.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

We partner with sustainable suppliers or utilize suppliers who share in the sustainability commitment
Tick all that apply.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Green Implementation

Management practices greatly affect the implementation of green procurement Tick all that apply.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Training and Awareness greatly affect the implementation of green procurement Tick all that apply.

- Strongly Disagree
- Disagree
- Neutral
- Agree

- Strongly Agree

Cost of green products greatly affect the implementation of green procurement Tick all that apply.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

Bid Specification greatly affect the implementation of green procurement Tick all that apply.

- Strongly Disagree
- Disagree
- Neutral
- Agree
- Strongly Agree

APPENDIX B – ETHICAL CLEARANCE

City of Johannesburg
Department of Group Corporate & Shared Services: Human Capital Management
Office of the Deputy Director: Employee Relations and Development

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Memorandum

TO : Ernest Mutenda
University of Johannesburg
Master Degree (MTech- Operations Management)

FROM : Enoch Mafuyeka
Deputy Director: Employee Relations and Development

DATE : 22 July 2017

SUBJECT : **RESPONSE ON THE REQUEST TO CONDUCT A RESEARCH ON TOPIC:"AN ASSESMENT OF THE IMPLEMENTATION OF SUSTAINABLE SUPPLY CHAIN MANAGEMENT (GREEN PUBLIC PROCUREMENT)."**

The above matter refers to the letter received on the 08 May 2017, in which a request was made to conduct a research in the City of Johannesburg.

The City of Johannesburg hereby grants permission to conduct the above-mentioned study, on the provision that proof of granting ethical clearance be provided prior to commencement of the study.

Please note that on completion of the study, a copy of the research report should be submitted to the City of Johannesburg in honour of your commitment.

The City of Johannesburg wishes you the best during the period of research.

Please do not hesitate to contact us if we can be of further assistance.

Kind Regards

Enoch Mafuyeka
Deputy Director: Employee Relations and Development
Tel: (011) 407-7250
Email: Enochm@joburg.org.za

24/06/2017